E and LP

JANUARY 15, 1960

NEWS IN PERSPECTIVE

MANAGEMENT VIEW

UTILITIES' FORECASTS of business investment are the best, the Budget Bureau says. Among six broad individual industry groups, an approximate order of ranking of performance from best to weakest in anticipating year-to-year change in various industries' spending for plant and equipment is as follows: Public utilities; all industries; manufacturing; railroads; commercial and other; mining; and transportation other than rail. "The estimates for the last three groups have been much weaker than the others," notes the agency.

REVENUE GROWTH for electric utilities in the years ahead should out-run rising costs and depreciation...with only the tax burden promising to climb faster, predicts "The Value Line Investment Survey" of Arnold Bernhard & Co. Power companies are likely to be more successful in translating this revenue growth into comparable advances in per-share earnings, says the Survey, because increasing internal cash generation and lower level of plant construction--plus a more widespread adoption of stock dividend policies--will substantially reduce the need for common stock financing.

GIFTS TO CHARITY by public utility companies are within corporate rights, the Illinois Commerce Commission has ruled, possibly the first time the issue has been spelled out by any state regulatory body. Ruling on the case of a disputed $290,000 corporate contribution by the Illinois Bell Telephone Co. to Chicago's "Crusade of Mercy" (Red Feather) campaign, the Commission declared that such contributions work "to the ultimate benefit of the donors, building goodwill and strengthening the economic well-being of the community."

"MISREPRESENTATIONS OF FACT" are charged by private utility spokesmen reacting to the recently publicized senate subcommittee statement which included the prediction that the Soviet Union will surpass the U.S. in electric power production in about 15 years. (The subcommittee report resulted from the recent tour of Russian power facilities by an 11 member group, including subcommittee members and several public power advocates.) The PIP-suggested reply (released locally) included comment based on EEI material: "Since a number of these visitors to Russia are advocates of government development of electric power, it is not surprising that they have emphasized hydro-power...but they did not point out the fact that America now has about three times the hydro capacity of Russia."

NEW A-POWER PROJECTS may be undertaken--if utilities act before May 1--in response to invitations extended by the AEC for two additional prototype nuclear powerplants proposed for construction in the Commission's Power Demonstration Reactor Program. For one plant incorporating a boiling water reactor, utilities are asked to provide the plant's conventional portion and operate the entire plant, on its own site, purchasing the steam produced. Utilities submitting proposals for an organic-cooled and moderated reactor prototype are expected to design, construct and operate the entire plant. Competitive nuclear power in future designs is the goal of the newly announced projects.

FRIENDLY CHATS with established industrial executives do the selling in a new and effective industrial development brochure distributed widely by Wisconsin Public Service Corp. "Communities are anxious to help you in wonderful Northeastern Wisconsin," says the brochure, noting that 30 industrial development corporations representing these communities will furnish "extensive information and assistance."

NEWS IN PERSPECTIVE

ECONOMIC CLIMATE

UPWARD MOVEMENT of business is becoming marked. Personal income is at a record rate, and consumer spending is keeping a brisk pace. Plant and equipment outlays are expected to rise in the near future, and business is trying to rebuild inventories. All major industry groups show unfilled orders well above last summer's totals, and new orders are coming in rapidly.

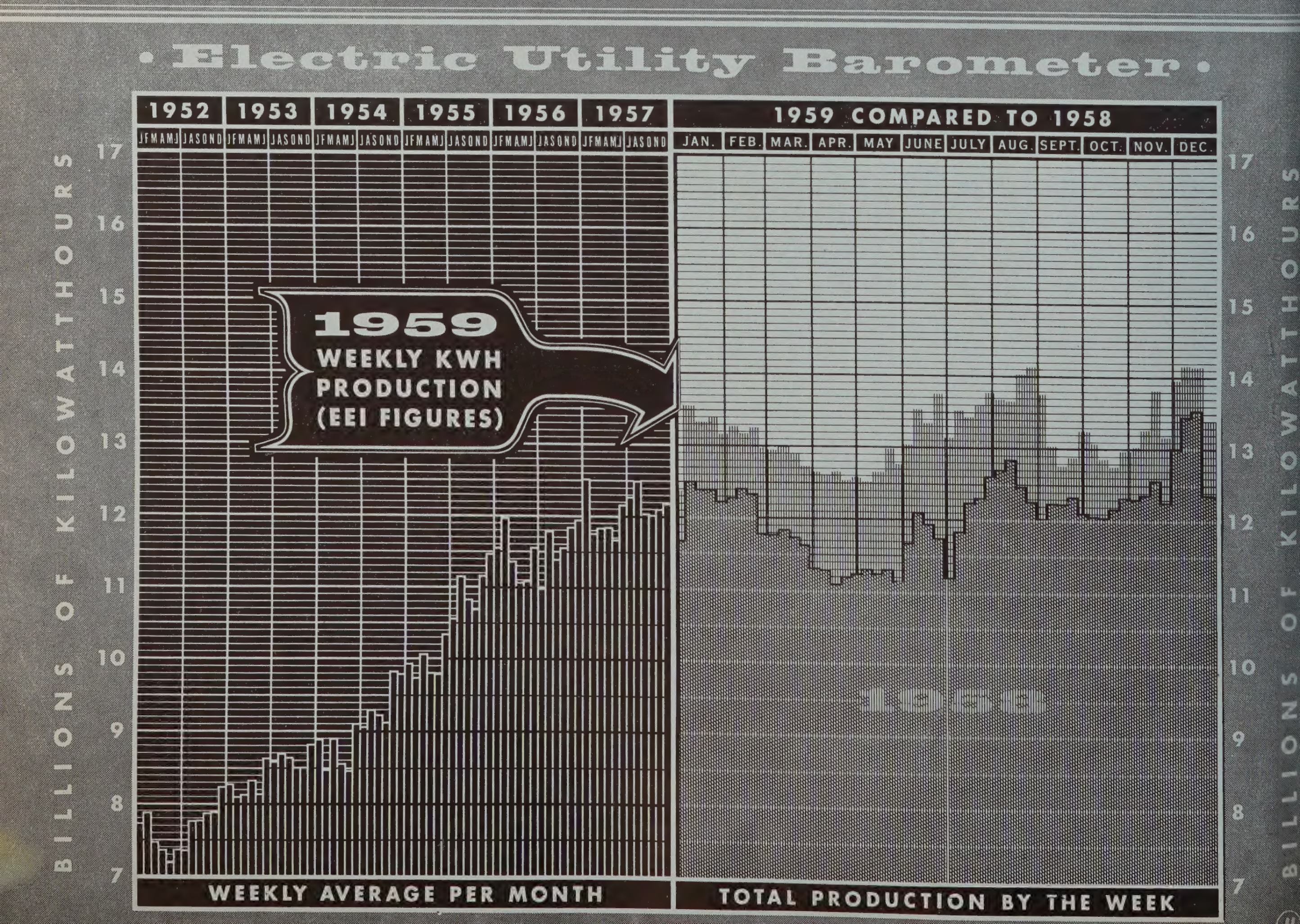
BASIC METALS OUTLOOK, barring protracted strikes, is bright. Copper-consuming industries chalked up a 20-percent gain in 1959, and another five percent hike in shipments of copper-base products is looked for this year.

Supply of refined copper will probably equal demand by the second quarter, and should be in excess of needs by the third. Continued growth is anticipated for aluminum. Shipments to consumers are likely to rise at least 10-percent, and maybe as much as 15-percent this year because new uses are being found for the light metal. Steel production, put at 125-million tons or more this year, will be about 36-percent higher than in strike-ridden 1959.

ELECTRICAL SHARE OF CONSTRUCTION in 1960 should be as high as 12-percent of a record $85.1-billion building volume, states the National Electrical Contractors Association. The unusually bullish forecast calls for $58.6-billion in new construction and the rest in repair and modernization. It involves $10.2-billion worth of electrical work--$2.2-billion more than last year's total. The electrical segment of construction is gaining more rapidly than construction in general, the group says, noting that electrical construction keeps close pace with new generating capacity.

WASHINGTON INFLUENCE

REPORT ON SOVIET ENERGY made by a Senate subcommittee after an on-the-spot



survey is believed to help build demand for passage of S. Res. 71--a national power survey that might presage federal insistence on a huge power grid for the whole U.S.--and to lay the groundwork for inclusion of many new federal power project starts in this year's Public Works bill. The subcommittee states that although the U.S. is still far ahead of Russia in power production, the Russians could overtake this country in 1975 "unless we speed up or they slow down." The subcommittee also says that since Russia uses more power for industry than this country does, the U.S.S.R. could surpass the U.S. in the amount of power used in industry by 1973. The group noted that 80-percent of Soviet electricity is thermal-generated, and that atomic power is not expected to supply significant amounts of energy in the next few years.

STATE "BUY-AMERICAN" LAW can not override a treaty, according to California's attorney general. He ruled that a state law giving preference to U.S.-made items was in conflict with the U.S.-Swiss trade agreement, which exempts from most-favored-nation treatment only items bought by government bodies "not for resale or use in the production of goods for sale." The Attorney General held that a Swiss low bidder should get a generator contract from the State's Department of Water and Power since "electricity is a commodity, manufactured, transported, and sold as are other more tangible goods."

LOBBYING COST RULES that had been strongly protested by utilities and by many other business and labor groups have been issued in final form by the Internal Revenue Service with virtually no change from their original form. As published, the regulations would appear to ban tax deduction for expenditures made in the ECAP program. Some observers believe that the IRS deliberately promulgated very tough rules in order to cause Congress to take an early look at a situation in which "the cost of advertising to promote or defeat legislation or to influence the public with respect to the desirability or undesirability of proposed legislation is not deductible as a business expense, even when legislation may directly affect taxpayer's business."

ECAP ADVERTISING CASE will be decided directly by the Federal Power Commission without the filing of an intermediate decision by the FPC examiner who presided at the hearings. Counsel for the 76 utilities involved in finding out whether costs of certain ads are deductible as expenses requested the omission.

FPC SHOW-CAUSE ORDER has been issued to New York State Electric & Gas Corp. of Ithaca, N. Y. The Commission wants to know why the company did not follow reporting and accounting procedures for accumulated deferred taxes on income.

PUBLIC WORKS FIELD HEARING will be held in Indianapolis on Feb. 5--part of the program of the Senate Select Committee studying present and future water power needs. The Committee staff is also supervising studies by 20 federal agencies, 50 state departments, public and private power associations, as well as extensive surveys by 3 private firms.

RECISSION OF RULE 9 of Public Utility Holding Company Act has been postponed until Feb. 29. Some companies are seeking exemption from the Act other than under Rule 9.

INDUSTRY SIFTINGS

HYDRO-GENERATOR PRICES, cut 10-percent by GE at year's end, reversed the upward trend last marked with a raise in Sept., 1958. The reduction was "recognition of competitive conditions in the marketplace," according to GE's M. W. Johnson. There was no immediate announcement by other key suppliers, though Allis-Chalmers reaffirmed to EL&P its policy of "remaining competitive in all areas of power equipment sales." (Like Westinghouse, A-C boosted quoted prices for power transformers 10 to 15-percent, depending on ratings.)

INVENTORY REDUCTIONS have been halted, generally, and some P.A.'s are doing some rebuilding--especially where they can get steel items--says the latest NAPA Business Survey Report. Some items of electrical equipment remain "on the down side", says the Business Survey Report in its summary of specific commodity changes.

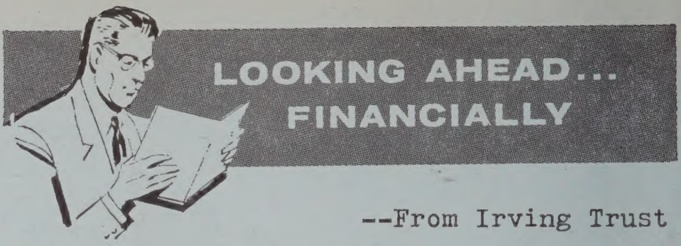
NEWS IN PERSPECTIVE

"ELECTRICITY SPARKS THE '60's", banner under which the electrical industry moves into the new decade, is being unfurled for the first time during National Electrical Week (Feb. 7-13). In his year-end statement timed to spotlight the Week, Chairman N. J. MacDonald of NEMA refers to "drawing boards crammed with new product ideas to match the far-reaching needs of what promises to be a fabulous decade of opportunity and achievement."

AUTOMATED STEAM STATIONS are "an engineering reality," says GE's Arthur F. Vinson, vice-president and executive head of the company's apparatus and industrial group. "Application of transistorized digital computers compatible with existing sensing devices and automatic subsystems...to provide continuous precise control of the generating function...will make the fully automatic steam station an economic reality."

CONTROL COMPUTER SYSTEMS can be supplied by Westinghouse in "great variety", with the introduction of a computer "whose speed, input-output capacity and memory can be precisely matched to the needs of a particular process by the addition of semistandard 'function-modules'." Sufficient versatility and ruggedness are claimed to permit application in all industries.

JOINT PROPOSAL to develop A-power plant with boiling water reactor has been submitted to AEC by Consumers Power Co., Jackson, Mich., and by GE. Design is expected to provide a substantial increase in power per unit volume of fuel --perhaps to 75,000 ekw.



LOOKING AHEAD... FINANCIALLY

--From Irving Trust

Volume of new money financing for 1959 totaled $2,982,849,000 ($1,907,566,-000 electric) compared to $409,329,000 ($2,209,219,000 electric) for 1958. New money financing for December of $254,-153,000 (74-percent electric) off from November high of $362,826,000.

One AAA electric offering during December--$20-million Dallas P.&L. 1st 1/4's of 1989,to yield 5.10-percent to the public (no refunding protection)--was received poorly. Only 65-percent sold in two weeks. Two AA-rated electric issues were sold--$75-million of Con Edison 1st 1/4's of 1989 on the 2nd, yielding 5.15-percent to the public, and $7.5-million of Worcester County Electric 1st 3/8's of 1989 on the 8th, yielding 5.30-percent to the public. The Con Ed's were poorly received while the Worcester issue was accorded a fair reception. (Neither had refunding protection.)

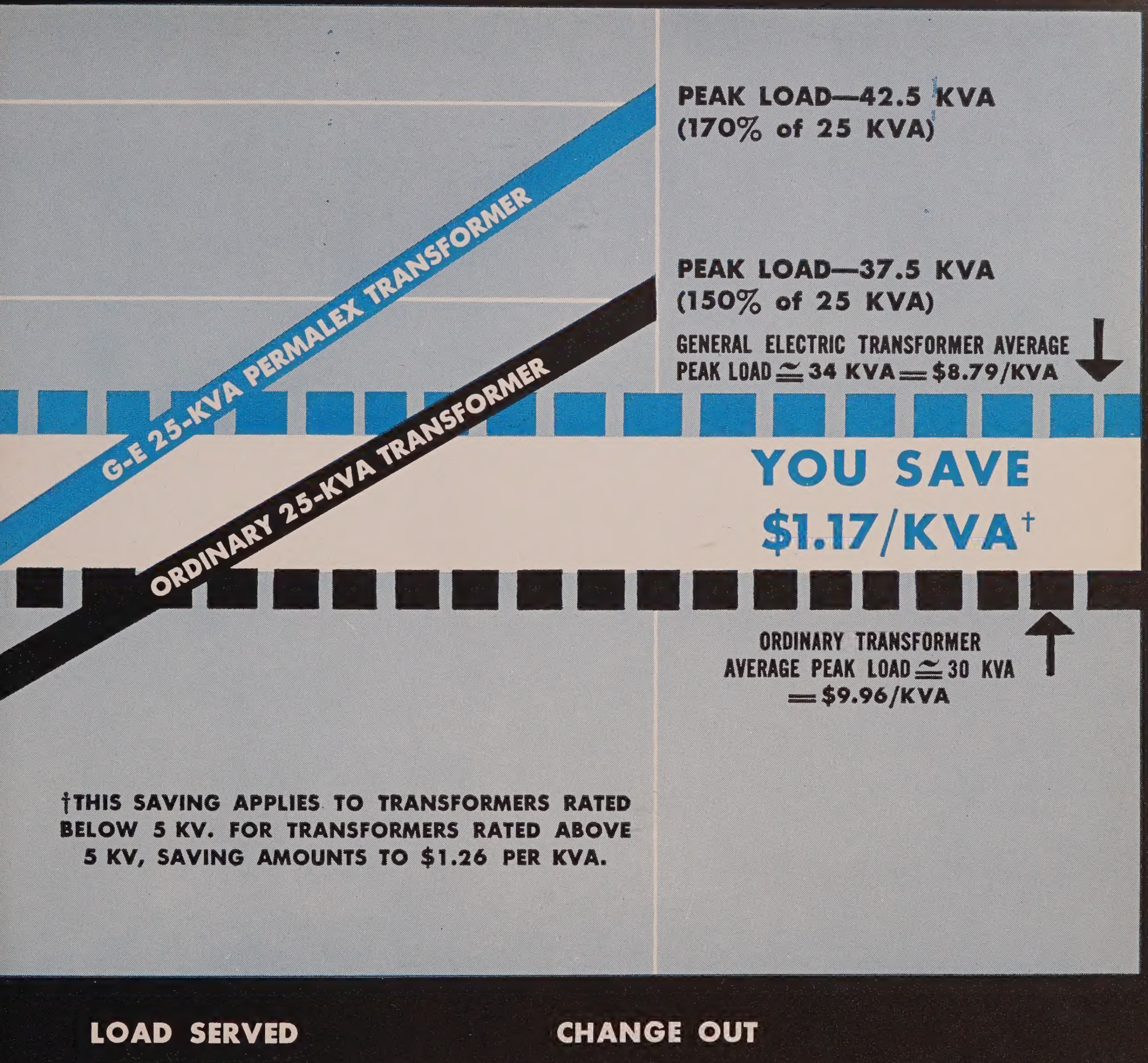
Of three A-rated issues sold, $16-million or Arkansas Louisiana Gas was very well received. The other two issues, both 1st 5-5/8's of 1989--the $15-million of Arkansas P.&L. and the $4-million of Missouri P.&L.--were fairly well received. Neither had any refunding protection.

In December there were two direct preferred and two principal common stock offerings. Prices on seasoned electric company bonds declined moderately, as was true for outstanding preferreds.

THE IRVING TRUST INDEXES SHOW:	Bond Averages	November 30, 1959	December 31, 1959
		% Yield to Maturity	
	"Aaa"	4.63	4.74
	"Aa"	4.63	4.78
	"A"	4.80	4.99

Stock Averages	Preferred--$ Yield		Common--$ Yield		Price/Earnings Ratio	
	11/30/59	12/31/59	11/30/59	12/31/59	11/30/59	12/31/59
	5.00	5.04	4.27	4.24	17.5	17.6
	5.08	5.16	4.34	4.43	17.3	17.4
	5.20	5.30	4.39	4.38	15.9	16.0

You get these savings with G-E 25-KVA Permalex transformers



General Electric's new distribution transformers through 167 kva handle up to 20 percent greater overloads—with full operating life. This added loadability can reduce your transformer investment per kva of load served. Here's why:

On the average, transformers are changed out when peak load reaches 150 percent of rated load. With Permalex insulation in General Electric's new transformers, you can reach 170 percent of rated load before changing out. **As shown in the example above,** a 15-kva transformer would normally be changed out when peak load reaches 22.5 kva. A 25-kva unit would then be installed and used until the load increased to 37.5 kva. The average peak load on this ordinary transformer would be 30 kva. Since the net price of a 25 kva, conventional, no tap, transformer below 5 kv is $299, the resultant cost is $9.96 per kva of load served.

With General Electric's 20 percent added loadability, a 15-kva transformer would be used until the peak load reaches *25.5 kva.* A 25-kva unit would then be installed and used until the load reached *42.5 kva,* or 170 percent of rated load. The average peak load of the G-E transformer would then be 34 kva. Again, since the price of the 25-kva transformer is $299, the resultant cost is $8.79 per kva —or a saving of *$1.17 per kva of average peak-load capacity over ordinary transformers.*

Are you taking advantage of this dollar-saving opportunity? For complete information on how you can make Permalex insulation pay off, contact your G-E Sales Engineer, or write for bulletin GEA-6070 to Sect. 431-89A, General Electric Co., Schenectady, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

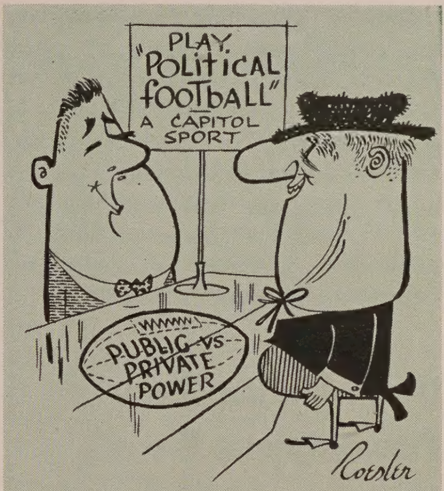
Utility Buyers Meet, Face "New Challenges"

"Tomorrow's Problems Today"—theme of the 29th annual mid-winter conference of the NAPA Public Utility Buyers Group — covers a program planned to present expert forecasts of "challenges of the future." The meeting is being held at the Atlanta Biltmore Hotel in Atlanta, Ga., Jan. 31-Feb. 2.

In announcing their conference, the Utility Buyers Group, largest in the National Association of Purchasing Agents, commented that, "though conditions confronting purchasing agents may change only slightly in the months to come, changing conditions will always be with us. The important fact is that we know how to face them . . . and we are certain that at the end of this conference, we will have a better insight into tomorrow's problems . . . so that they can be solved today."

The problems involved in pricing will, as usual, be prominent on the Buyer's program. These speakers will discuss aspects of this key subject: George H. Cole, manager of purchases of Alabama Power Co. ("Artificiality of Pricing Structures"); C. William Mills, manager of the Westinghouse electric utility sales department ("Obtaining Value for Your Electric Utility Dollar"); Wm. S. Ginn, vice-president and general manager of the General Electric turbine division ("Scheduling and Pricing Problems — Heavy Electrical Equipment"); Donald S. Walker, vice-president of Combustion Engineering, Inc. ("Steam Generators Scheduling and Pricing Problems"); and Oliver D. Butler, assistant director of purchases, Commonwealth Edison Co. ("Current Escallation Practices").

Among others on the program are: Edwin Vennard, EEI's managing director ("What Shall We Do to Preserve Freedom?"); C. F. Ogden, vice-president of Detroit Edison Co. (Business Survey Report of NAPA); and Mark B. Covell, superintendent of supply for Union Electric Co. ("Role in Capital Equipment Buying").


PLAY "POLITICAL FOOTBALL" A CAPITOL SPORT
PUBLIC VS PRIVATE POWER
Coesler

"I'M LOOKING FOR SOMETHING TO KICK AROUND DURING A POLITICAL CAMPAIGN."

EEI Awards to Salute Specific Market Promotion

A change in the rules governing the competition for the annual EEI Sales Promotion Awards allows 1959 entries to be based on individual phases of a company's over-all sales program in any of the four markets—Residential, Farm, Commercial and Industrial—whereas in previous years, it was required that an entry cover an over-all promotion.

There are three Awards for each of the four markets, offered in recognition of outstanding sales promotion programs during the past year. In each of these categories there are three classes based on number of meters served. These and other entry terms and conditions are set forth in four folders—one for each market—already mailed out to EEI member companies. This year, entry rules have been simplified and condensed for easy study and application, reports EEI.

Further information on the 1959 Sales Promotion Awards may be obtained from Edison Electric Institute.

BLS: Utility Employment Will Rise Slowly in 1960s

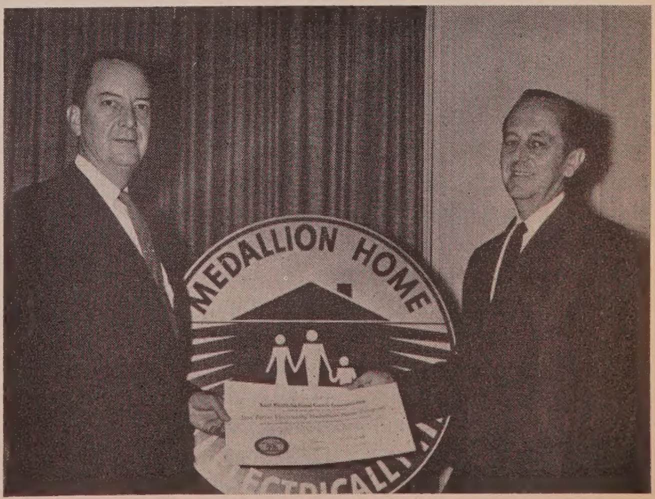
The employment outlook in electric utility systems in the 1960s is for a slow increase — slower than the 20-percent growth in population expected and slower than the increase expected in power capacity and production, according to the U. S. Bureau of Labor Statistics. More use of instrumentation and larger and more automatic equipment is responsible.

Most openings will be replacement for those who die, retire, or transfer. But in the industry, which employed 450,000 in 1958, this will mean thousands of openings a year. BLS looks for maintenance workmen to grow more numerous and for substation operators to decline in some residential areas.

Little increase in powerplant employment is expected during the coming decade, with a continued slow increase among transmission and distribution workers. In customer servicing occupations — despite automation — BLS foresees slowly rising employment.

LARGEST SINGLE FRANCHISING on a unified basis in the history of the Medallion Home Program — and the first award made since the Medallion Program has come under the direction of NEMA—was made in mid-December to 20 rural electric cooperatives, representing approximately 200,000 member consumers in Kentucky.

The franchises were accepted on behalf of the cooperatives by J. B. Galloway, manager of Farmers RECC (left) from NEMA'S L. Messick.



Report on Intertie Of BPA-California

For a report to be made to a U.S. senate committee about Feb. 1, state governors and various consulting groups are now studying the preliminary draft of conclusions based on a six-month study of the feasibility and desirability of a high voltage interconnection for disposal of surplus secondary hydroelectric energy from the Federal Columbia River power system. The preliminary draft of the report launched with a senate committee resolution last May and prepared in cooperation with the Bureau of Reclamation, was released the end of December by Bonneville Power Administrator Wm. A. Pearl. The report underscored these key points:

1. The market in California for such surplus secondary power with its limited availability appears to be as use for fuel displacement in northern California thermal generating plants.
2. Only one of six alternate interconnection plans studied is considered economically and financially feasible—a 95-mile line between Klamath Falls, Oregon, and Pit No. 3, east of Redding, Calif.—at 230,000-volts.
3. The preference clause of the Bonneville Project act would apply equally to customers in the Pacific Northwest and in California.

The study indicated that such ties should be limited to 230,000-volt lines, with analysis of proposed 345,000-volt transmission lines demonstrating that they were not economically feasible. The economic and financial feasibility of the one 230,000-volt interconnection is based on the assumption that only power excess to the needs of the northwest would be marketed at present rates within the BPA service area. Alternate proposals vary in economic feasibility and generally show unfavorable benefit-cost ratios.

The report indicates that coordination of the U.S. Columbia river power system with the Bureau of Reclamation's Central Valley project in California yields no increase in critical year capacity for the two systems through use of surplus secondary energy. Firm critical year capacity could be increased between the federal systems in the northwest and in California by some 500,000-kilowatts, but would require the use of high availability secondary and provisional energy now being utilized by industrial customers and utilities in the Pacific Northwest. Also, this potential benefit would decrease in future years as now Columbia river installations equalized benefits from present system diversities.

The study analyzed various combinations of 230,000 and 345,000-volt transmission lines for the purpose of marketing excess power and coordinating cooperations. Potential power markets, loads and resources in both northern and southern California, including public and private utilities were considered in the studies.

An opinion on the effect of the proposed interconnections on rights of preference customers was specifically requested in the senate resolution.

Union Electric Starts Pump-Storage Project

Work will begin early this year on Union Electric's new Taum Sauk "pumped-storage" plant, subject to approval of regulatory authorities, and the novel plant is expected to be ready for service in the spring of 1963. A contract for the construction and installation of equipment has been awarded to the Fruin-Colnon Contracting Company of St. Louis and Utah Construction and Mining Company of San Francisco as joint venturers.

The construction portion of the job involved some $20-million of the $50-million project. The remaining $30-million is in the purchase of equipment, design, transmission system, lands and rights-of-way, etc.

Only two other large "pumped-storage" plants—one at Niagara Falls and another in Great Britain — are being built at the present time, and Union Electric's project will be the largest so far authorized. There are several smaller plants in this country and abroad.

Union Electric's "pumped-storage" project involves the creation of two small pools, one on the east fork of Black River at Taum Sauk Creek, and the other on top of a granite mountain nearby, which rises some 1,000 feet above the surrounding terrain.

Combination pump-turbines using night power available from St. Louis area steam plants will move the water from the lower to the upper pool each night. The water will then flow to the lower pool during daylight hours, generating 350,000 kilowatts of electricity in the process. The project is possible due to development in recent years of electric generators that, when operated in reverse, become pumping equipment.

LOOKING OUT from the end of one of Oxbow Dam's two cavernous power tunnels, you can see the course water will follow as it flows far underground from reservoir through mountain to the 200,000-kilowatt powerhouse of Idaho Power Company's new project. At point seen here, water channeled through power tunnel will branch into two-steel-lined penstock tunnels whose entrances are seen in background. Penstocks will drop water some 100 feet on a sharp slope to two of Oxbow's four initial generating units. Water for two other units will be supplied by second power tunnel and two more penstocks located beside those shown here. Workmen have finished driving the penstock tunnels, which were Oxbow's last major tunnel-excavation chore, and have started concrete-lining operations in the power tunnels to set the stage for completion of numerous phases during 1960.

WASHINGTON OUTLOOK

by RALPH ELLIOTT
Washington Editor

Battle Over I.R.S. "Lobbying" Rules Is Shifted To Congress

The fight to preserve the fundamental right of business to petition Congress and to conduct self-defense advertising without incurring a bureaucratically imposed federal tax penalty, has shifted from the Internal Revenue Service to Capitol Hill. It's going to be a whale of a scrap, but the prospects are dim that a winner will emerge in 1960. Enough feathers will fly during the year, however, to give a pretty good indication of what the ultimate outcome will be.

As predicted in this column (Jan. 1 issue, page 27) IRS has dumped in Congress' lap the job of deciding the far-reaching issues involved. The dumping was by way of final adoption, precisely as proposed, of the politically inflammatory regulations promulgated last September which cover non-deductibility for tax purposes of expenditures for "lobbying" and for "propaganda advertising" related to political matters.

To many observers the refusal of IRS to modify a single word of the proposed regulations was somewhat shocking in view of the extensive and, for the most part, basically sound criticism which the rules drew from a broad segment of taxpayer interests during the two-day hearing by the Service in November. Behind the seemingly adamant position of IRS, however, are background elements that must come into the picture if this latest development is to be seen in proper perspective.

Much of the turmoil now surrounding the whole affair was touched off, with strong political as well as government vs. private power overtones, when Senator Kefauver in February 1957 insisted that IRS rule on the deductibility of contributions to the Electric Companies Advertising Program. The result was a ruling about a year later that the ECAP expenses were non-deductible. That decision was bottomed on then applicable regulations, which had been adopted under the 1939 Revenue Code, as modified by then pending (but never adopted) regulations published in 1956 to conform with the 1954 code. Immediately the ruling aroused a number of business groups—notably those in the publishing field—into joining the ECAP companies' cause.

It was in this atmosphere that the Supreme Court in February 1959 handed down its opinion upholding IRS is the *Cammarano* and *Strauss* cases. There the Service had disallowed, under the 1939 Code regulations, the cost of advertising against state initiative measures which would have destroyed the taxpayers' businesses. What the court held, in essence, was that IRS has authority to issue regulations; that Congress had acquiesed in the regulations involved, thus giving them the force of law; and that such regulations had been properly applied to the facts in the two cases. Although by no means "on all fours" with the facts and issues in the ECAP matter, *Cammarano* and *Strauss* had enough surface similarity to add considerable fuel to the fire and to swell the ranks of business interests actively protesting IRS policy.

The Service found itself in a rather strange position. It was aware that vastly changed conditions in the fields of government-business relationships and legitimate political activity by private citizens pointed toward a need for changes in taxing policies reaching into those areas. But it was also realistic. It had decided that policy changes affecting political activity should come through Congressional, not administrative, directive. Moreover, being a revenue-raising agency, the Service could hardly, in any event, justify diluting on its own initiative the tax-collecting effectiveness of its long-standing regulations—and much less with people like Kefauver breathing down its neck.

In the hope of at least allaying some business's mounting fears, the Service last September withdrew the 1956 version of the rules and substituted new and purportedly more definitive ones. IRS officials claimed the 1959 version went as far as practically possible in spelling out what is deductible as well as what is not. They promised that the new rules would be administered "fairly and equitably."

If any fears were allayed, it wasn't evident at the November hearings. The regulations reaped a torrent of criticism—from just about every angle, including dozens of major companies, trade associations, and now even the big labor unions. (The rules would reach clear down to the union dues of individual workers if a "substantial part" of the union's activities are in the political field.)

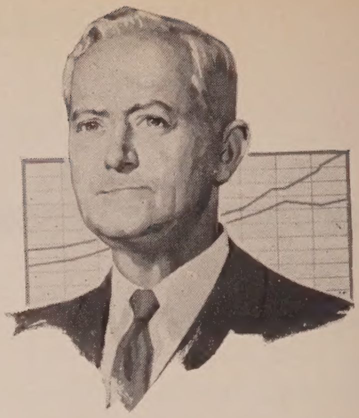
In short, the IRS had had it.

From then on it was a matter of getting Congress to lay down the guidelines, and the sooner the better. One possibility was to hold the regulations in abeyance pending the outcome of the Ways and Means Committee's broad-scale revenue revision hearings. But it was obvious when those hearings wound up last month that no Congressional light would be shed via that avenue before 1961. So IRS chose the other alternative: adopt the regulations as is, and let the interested taxpayer groups take it from there.

Congress undoubtedly will be pressed to enact clarifying legislation this year. One pending measure that would overrule the IRS regulations was introduced last session by Rep. Hale Boggs, a high-ranking Democrat on the Ways and Means Committee. Others will be going into the hopper soon, some of them probably worded to make unmistakably clear the exemption of union dues.

But, this being an election year, it is doubtful legislation on such a controversial subject can get through the mill.

ECONOMIC REPORT



by A. C. FARMER
Economic Consultant

Two factors dominate the economic outlook for the early months of 1960: 1. the effect on general business activity of the long-drawn-out steel strike; and 2. the effect on general business activity of the tight-money program of the Federal Reserve Bank.

An Economic Forecast for 1960 . . .

THE STEEL STRIKE—Inventories are depleted, and since it takes time to fill the pipe lines and replenish the depleted inventories, general business activity will be at a low level in the first quarter of 1960. During the remainder of 1960 the index of general business should be moving steadily upward.

"TIGHT-MONEY"—As business gets under way in 1960, the problem that politically will cause the most concern will the increasing unemployment. The chief contributing factor at this point will be the tight-money program of the Federal Reserve Bank.

The tight-money program operates to slow up the borrowing of money, and this, in turn, operates to slow up business activity, since the spending of borrowed money is the stimulant that absolutely is essential to support expanding business activity.

According to the National Association of Manufacturers (in a brochure on "Money and Credit Management," issued in Oct., 1955) :

"Economic growth depends on an increase of debt." According to the Federal Reserve Bank in a study on installment credit, completed in March, 1957: "Debt is a necessary condition and concomitant of economic progress in an economy such as the United States."

It is, in fact, a sound conclusion that if the rate of borrowing money is retarded, the rate of business expansion also will be retarded—and in consequence, unemployment will increase.

In further evidence along these lines, attention is directed to the 1957-58 business setback.

In April 1955 the Federal Reserve Bank adopted a policy of steadily increasing monetary restraint designed to prevent serious price inflation. In furtherance of this program, Federal Reserve discount rates were increased step-by-step from 1½ percent in April 1955 to 3½ percent in November 1957.

The Federal Reserve Index of Industrial Production, after reaching a high point in 1956, began to contract in 1957, and dropped sharply through the last months of 1957, to reach a low point in April 1958.

When it became apparent that the tight-money program not only was preventing price inflation but also seriously was affecting business activity, the Federal Reserve discount rates were dropped rapidly from 3½ percent (November 1957) to 1¾ percent (April 1958).

With easier money, business activity soon improved and the trend continued upward until the steel strike in 1959—but parallel with this the Federal Reserve Bank began increasing the discount rates once again.

Chronologically the increases were as follows:

April 1958	1¾ percent
August	2 percent
October	2½ percent
March 1959	3 percent
May	3½ percent
September	4 percent

The drop in the index of industrial production closely is related to the monetary pressure exerted by the tight-money program. To repeat—a tight-money program slows up the rate of debt expansion since monetary forces dominate economic growth.

With the steel mills once more in operation, business activity will improve as steel flows from the mills to the factories, but the trend will not continue upward until the tight-money program again is relaxed.

Since 1960 is an election year, it is a foregone conclusion that Congress will not tolerate for long a situation of high unemployment. When it becomes apparent that putting the steel mills back to work has not corrected unemployment, Congress will insist that the tight-money program again be relaxed, just as was done November 1957 to April 1958.

After this action is taken, the trend of general business activity will establish an upward trend that will continue throughout the remainder of the year 1960.

NUCLEAR NEWS

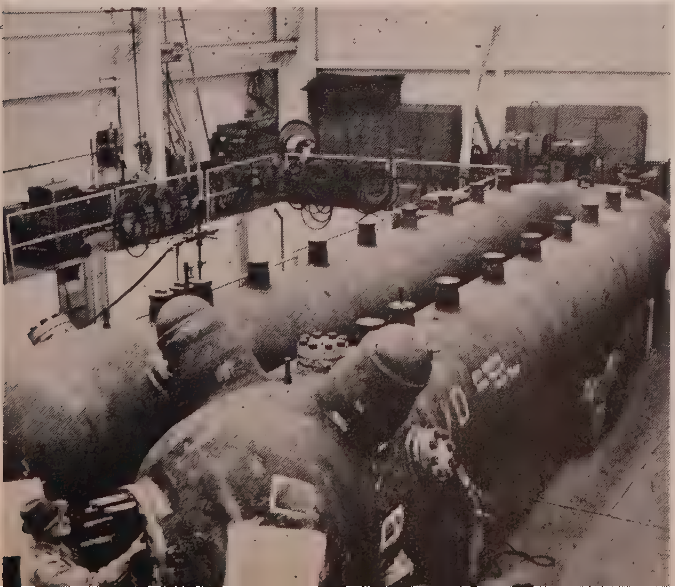
ATOMIC POWER "RECESSION" is getting a new round of publicity in the business press, with special reports on the "slump" in the atomic industry running in a number of publications. Conclusions are that with the amount of business as limited as it is and will probably be for some years to come, only a few of the bigger equipment suppliers are likely to survive . . . and these will probably be the old-line suppliers, not the just-born-to-grow-with-the-atom kind. Best hope long-range for better business ahead comes from: the AEC's 10-year plan and its stimulation, new operating data from the first plants coming on the line, and the guarantees such as Westinghouse and GE are now offering.

INDUSTRIAL REPROCESSING GROUP of five electric utilities and the Davison Chemical division of W. R. Grace & Co. has the approval of the AEC for its proposed study of the technical and economic feasibility of designing, constructing and operating a privately-owned plant for the reprocessing of spent nuclear fuels. Yankee Atomic Electric, Commonwealth Edison, Detroit Edison, ConEdison and Northern States Power Co. are members of the new group supporting the six-month study, to cost $250,000.

HTRDA HAS 52—PLUS ONE—Potomac Electric Power Co. has joined the 52 investor-owned electric utilities in High Temperature Reactor Development Associates, Inc.

SUPERHEAT FEASIBILITY, under study by Allis-Chalmers for the 62-kw nuclear powerplant at Sioux Falls, S. D., is confirmed, according to an A-C report to the AEC. Says the report: "The current capital cost of a two-region boiling superheating reactor, excluding all research and development, would be about the same as that of a boiling reactor and fossile-fuel superheater. In the future, we believe, use of a nuclear superheater will result in lower capital cost."

HEAT EXCHANGER for one of four generators at ConEdison's Indian Point nuclear generating station, this 60-ton unit is ready to leave Babcock & Wilcox. In its 40-ft length is ten miles of one-inch stainless steel tubing. The heat exchanger is 13 feet wide.

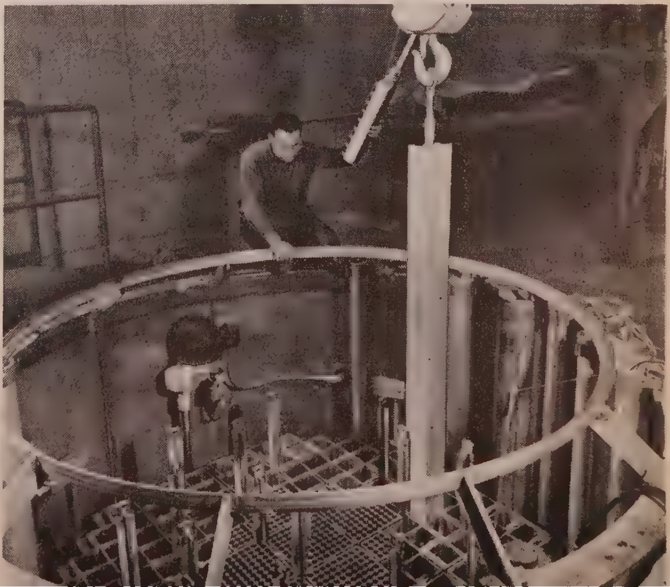


"NORMAL STARTUP PROBLEMS" of a purely mechanical kind being encountered in "shakedown" tests at Dresden were anticipated, and General Electric reactor designers expect to run into more of them before the tests are completed. Corrections of damaged seals and inadequate buffering action at the end of the control drive travel created, in turn, additional stress on the drives' shear pins. But, according to GE, "this does not indicate any shortcoming in the control drive design." Fuel loading is expected to resume at Dresden in mid-January.

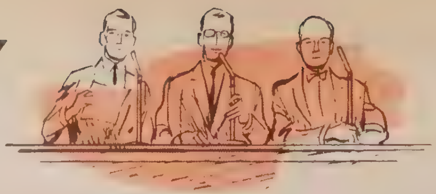
NEW YORK LEADERSHIP in the field of atomic energy would advance significantly if two bills proposed by Gov. Rockefeller are enacted by the state's legislature in 1960. The legislative proposals, based on recommendations of the State Office of Atomic Development, aim at: (1) furthering the public health and safety with respect to nuclear materials, (2) stimulating atomic industry within the state, and (3) authorizing the state to assume regulatory control over aspects of atomic development affecting public well-being. Meanwhile, the N. Y. Office of Atomic Development has contracted with the Univ. of Buffalo to provide up to $1-million in funds toward the $2-million cost of a new Western N. Y. Nuclear Research Center; and several N. Y. electric utility companies are reported to be discussing the possibility of joining in a $70-million project to build a 350-mw atomic powerplant, in an effort to push atomic power development within the state.

SOVIET INTEREST in U. S. nuclear power developments, said Prof. V. S. Emelyanov, was greatest in the case of two projects visited on the tour here last November—Dresden and the Enrico Fermi plants. "The Fermi station is a very bold concept in engineering design. The Dresden station (utilizes) very simple, but effective engineering designs."

CRITICAL FACILITY used by Allis-Chalmers to obtain experimental data for reactor design is one tool in a greatly expanded capability to serve "in all fields of fission power." Working on the Pathfinder and Elk River projects, A-C also plays a major role in thermonuclear research.



REGULATORY REVIEW



An Appraisal of the "Cost of Capital"

Bell System Report says that "Cost of Capital" has major shortcomings as a measure of proper earnings for the utility industry.

This is an important contribution to regulatory thought, and is part of an extensive analysis prepared by AT&T and its system companies dealing with regulation and the economic position of the utility industry. Because of its importance, the following Section which is part of a brochure called "Earnings Concept" is quoted almost in full:

"1. Introduction

"In establishing utility rates, regulatory authorities since World War II have relied almost exclusively on what has become known as the 'cost of capital' concept. More important, utility management frequently has gone along with such a concept. Since we're going to look at the adequacy of this concept, we should know what 'cost of capital' means. The term has been defined in several opinions of the United States Supreme Court.

"In the Southwestern Bell case, (May, 1923), the concurring opinion of Justice Brandeis and Holmes said:

"'It is therefore feasible now to adopt, as the measure of a rate, the annual cost or charge of the capital. . . . Capital charges cover the allowance, by way of interest, for the use of capital whatever the nature of the security issued therefore; the allowance for risk incurred; and enough more to attract capital.' The opinion goes on to make this pertinent point: 'The reasonable rate to be prescribed by a commission may allow an efficiently managed utility much more.'

"Again in the Bluefield Waterworks case (decided in the same year), the court said:

"'The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate . . . . to maintain and support its credit and enable it to raise the money necessary for proper discharge of its public duty.'

"Summing up, 'cost of capital' is that prospective level of earnings which is acceptable to investors and which will enable the utility to continually attract capital in the quantity required. This must be accomplished on terms which will (1) maintain the credit of the utility, (2) protect the financial soundness of the utility, and (3) not impair the integrity of the existing investment in either the debt or common stock of the company.

"Unfortunately, regulatory commissions and, to some extent, utility management have looked upon the 'cost of capital' concept as basically an 'attraction of capital' standard. They simply assumed that a utility's existing level of earnings is adequate if it has been able to raise new capital, even though such new capital has been secured on terms and conditions harmful to the soundness of the existing investment. This is absurd. A company with very low earnings or even on the verge of bankruptcy can still raise some new capital.

"2. Adequacy of the Concept

"Throughout recent years there has been a substantial disagreement among rate of return witnesses as to the proper methods of determining cost of capital. In this report no attempt has been made to resolve these differences. Rather, this study's appraisal of the adequacy of the 'cost of capital' idea is based on the assumption that such cost has been fairly determined.

"Cost of capital, even when properly determined, fails to fully meet certain economic functions of earnings. It is also an unrealistic concept in the light of the way the general economy functions.

"a. When earnings are limited to 'cost', the incentive is not provided for management to operate more efficiently, provide wider markets beyond the expressed demand of the community and provide service of increasing value to the customer.

"b. Cost of capital fails to recognize the function of profits as a measure of how well the business meets its social obligations to the economy.

"c. It gives no recognition to the relative efficiency of operation and use of manpower and natural resources.

"d. It minimizes the possibility of capital expansion through retained earnings.

"e. In the area of competition it has little use or effect in determining pricing policies. Since prices are set by the least successful or marginal producer, cost of capital is the minimum which he must recover.

"f. Cost of capital also has no significance in the competitive economy in setting a limit on the level of earnings actually realized. If earnings in the competitive area of the economy were, in fact, limited to the level of the 'cost of capital', market prices of common stocks over an extended period would be substantially identical with the book cost. But this is not so. Market prices have averaged considerably above book cost over a period of nearly half a century.

"g. Cost of capital is merely a concept of survival or what minimum level of earnings is necessary to get by. It is at the threshold of confiscation.

"As a result of these deficiencies, the position of the utility investor has been adversely affected as compared with that of owners of common stocks in other enterprises.

"3. Practical Difficulties . . .

"Calculation of 'cost' of equity capital starts with market prices of outstanding stock prices received for new issues. It should be obvious, however, that the essential factor determining these prices is the expected level of future earnings, not past or present earnings.

"The problem of determining relative risk must be faced if 'cost of capital' is fixed on consideration of data from other companies or industries. As brought out in the Southwestern Bell case, relative risk is an element in 'cost of capital'. To date no quantitative measurement of risk has been developed.

"Other problems arising from the 'cost of capital' concept include determining the cost effects of variations in capital structure on the cost of individual classes of capital, and determination of an equitable adjustment to offset the effects of inflation.

"4. 'Cost-of-Capital', Inflation

"'Cost of capital' as it has been applied generally by most regulatory authorities since World War II could not possibly cope with the ravages of inflation. At best it merely has considered the level of prospective earnings, in current dollars, which is necessary to attract capital, again in current dollars. It is clear, therefore, that if a present-day fifty cent dollar coming into the business shares equally with a pre-inflation hundred cent dollar in the earnings of the business, some part of the old investor's property has been taken away and the integrity of his investment has not been maintained.

"It will suffice here to say that an appropriate allowance can be included within the scope of the 'cost of capital' concept so as to give the investor the same protection against the effects of inflation which he has obtained in the competitive area of the economy.

"5. Why It's Been Used

"There are a number of reasons for this, principal among them being (1) the influence of court opinions, (2) the anti-utility bias arising out of the political atmosphere of the past quarter century, (3) a belief that the consumer is benefited by the lowest possible rates at the moment and that the only function of the commission is to 'protect' the consumer, (4) the failure to balance the interests of the investor and the consumer to the extent that these appear contrary to each other, and to give due weight to equitable treatment of the investor, and (5) the deceptive appearance of mathematical precision in the typical determination of 'cost of capital' which appears to absolve the commission of its responsibility for exercising independent judgment. Judgment must always be relied on in any determination of a proper rate of earnings.

"Furthermore, the tendency of both commissions and commission witnesses has been to resolve judgment determinations against the utility.

"6. Conclusion

"From the foregoing it is apparent that a properly determined 'cost of capital' concept is a fair measure only of the minimum earnings required to permit a utility to perform its functions in the economy. It measures the threshold of confiscation. Accordingly for both legal and economic reasons this test of a fair return cannot be abandoned.

"It appears, however, that since the 'cost of capital' concept is merely the threshold of confiscation, it does not, of itself, meet other tests important to the public as well as the investor: (1) if it does not reflect the economic function of regulation as a substitute for competition in the setting of prices, (2) it results in a rate of return inadequate to completely fulfill the economic function of earnings in a free enterprise economy, (3) it adversely affects the position of the utility investor as compared with alternative investment opportunities, and (4) it fails to equitably balance his interest with that of the consumer." •

SMUD Operates Substation With "Zig-Zag" Design

SMUD's new $2.5-million Hedge Substation near Florin is now receiving regular deliveries of power from the Pacific Gas and Electric Company, under its contract with the United States Bureau of Reclamation, signed in 1955.

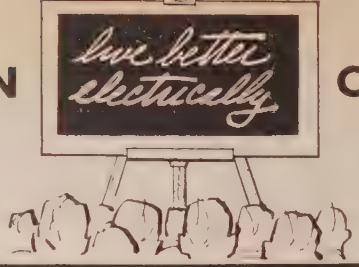
PG&E has installed new 200,000-volt switching and metering facilities to provide additional power for SMUD. The new facilities will be served from PG&E's interconnected network by its Feather River lines between Rio Oso and Bellota. The contract between PG&E and SMUD provides for deliveries up to 300,000-kw whenever needed. The new PG&E facilities represent an investment by the Company of $265,000.

The District's Hedge Substation has attracted national attention because of a unique design worked out by the District's Engineering Department and the Federal Pacific Electric Company. It has been tagged with the name of Zig-Zag Substation.

The ingenious design resulted in 11-percent less steel and 40-percent less concrete than the conventional design, saving an estimated $50,000 in materials alone, according to Paul E. Shaad, gen. mgr. and chief engineer of SMUD.

WELCOME TO WESTINGHOUSE from Indiana & Michigan Electric Co. came in the form of this attractive display in the window of the Muncie office as the city welcomed officials of Westinghouse for the groundbreaking and the start of construction of the supplier's new transformer plant. In the foreground is a model of one of the huge power transformers to be manufactured at the plant.

INDUSTRY IN CONFERENCE



S.E.E. Meeting Reviews Success Stories, Aims Higher in PR, Sales, Advertising

Significant changes in the characteristics of the electric utility business have introduced entirely new dimensions of public relations problems . . . and the continuing welfare of the investor-owned electric utility industry will be largely dependent upon the effectiveness of the public relations, advertising and sales departments of the utility companies.

This was the message of F. H. Coughlin, president of the Southeastern Electric Exchange and president of Central Louisiana Electric Co., in addressing more than 350 utility executives at the SEE Sales, Advertising and Public Relations Conference held recently in New Orleans.

Utilities had better be broadening their public relations, sales and accounting channels and cultivating them at a faster rate than ever before, said Ashton B. Collins, president of Reddy Kilowatt, Inc. Our customer problems do not lie in the engineering channels, Mr. Collins stated. Company promotions should not emphasize power plants per se—but what the new developments do for the customers. We are faced with many marvelous opportunities to sell the services of this great industry up and down main street and every alleyway and byway as well, he said.

Gas Competition

According to W. B. Shenk, vice president, Florida Power Corp., and chairman of the SEE Competitive Committee, if a customer used all appliances listed on the EEI list (of electric household appliances and estimated annual kwh) and hooked them up to a gas pipe instead of plugging them into the electric circuit, gas would eliminate 92 percent of the potential kwh on this list—and would leave the electric utility with a paltry 2,799 maximum annual kwh usage. He said that six appliances on the list account for 91 of this 92 percent of kwh listed for competitive appliances—ranges, refrigerators, water heaters, electric heat or heat pumps, air conditioners, and clothes dryers. At the 1958 appliance exhibit at Atlantic City, 55 manufacturers displayed a total of 69 new gas appliances and gas equipment developments *perfected in the last two years*, Shenk stated.

Utility sales department personnel has full time responsibility for the important problem of public relations and they must accept the responsibility, in the opinion of G. C. Rawls, president of Louisiana Power & Light Co. He said that there can be no good public relations without good employee relations. And 98 percent of utility employees want to do what their management wants them to do, Rawls stated. Delivering high quality service and above all things, on time, is an important factor that affects the problem of public relations. Nothing can cause so much ill will as the failure to deliver or the delivery of low quality or poor service, he said.

Revenue—Not Load

The prime objective for residential sales should be revenue—not load, said C. J. Sinnott, general sales manager, New Orleans Public Service, Inc. Appliances which yield the most profitable revenue should receive the major promotional effort. Load studies which give *facts* on revenue potentials of all types of appliances form a valuable guide in planning a sales program, Sinnott stated. Lighting of all types offers more in revenue development with less customer investment than many services utilities can promote.

Market Surveys Help Dealers

Howard B. Hicks, residential and rural sales manager, Carolina Power & Light Co., described an electrical appliance market survey conducted by CP&L by mailing post cards to 33,944 residential and rural customers. A new type 150-w lamp bulb was offered in exchange for answering a check list of 12 appliances. In only one month's time, the return was more than 50 percent and several thousand additional cards came in later. The results of this survey were found to be accurate to within five percent when checked with an actual door-to-door survey. The survey results were presented to appliance dealers and distributors through a series of 11 dinner meetings in the service area, Hicks said. It uncovered evidence that a tremendous market for electrical appliances still existed; it made the dealer realize that the survey could

F. H. Coughlin, president of Southeastern Electric Exchange and president of Central Louisiana Electric Co.; Ashton B. Collins, president, Reddy Kilowatt, Inc.; and E. A. Wilson, vice-chairman of the SEE Sales Conference and vice-president—sales, Alabama Power Co.

Industrial Sales Committee chairmen and speakers (l to r standing) C. D. Anderson, power sales engineer, Savannah Electric & Power Co.; W. M. Terry, director of engineering coordination, Allis Chalmers Mfg. Co.; R. D. Ketner, manager, utility sales development, General Electric Co.; W. Paul Lyman, industrial sales manager, Carolina Power & Light Co.; V. J. Nolan, manager, industrial sales promotion and development, National Carbon Co.; (seated l to r) Vice Chairman, Andrew H. Hines, Jr., director, area development department, Florida Power Corp., and Chairman H. Chester Gause, manager, industrial power sales, Alabama Power Co. The group gathered in the photo at right above includes: Commercial Sales Committee chairmen and speakers (l to r) Chairman B. M. Davis, director of market research and planning, Mississippi Power & Light Co.; L. V. Dugas, superintendent, industrial & commercial sales, Gulf States Utilities Co.; R. L. McCuen, commercial sales supervisor, Duke Power Co.; R. T. Dorsey, supervisor, commercial lighting, General Electric Co., and Vice Chairman Henry H. Orr, promotion manager, Duke Power.

serve no worthwhile purpose for CP&L unless, and until, he profited first through the sale of merchandise; and it encouraged a closer working relationship between dealers and company salesmen. Total cost of the survey was $6,100 but if each 150-w lamp mailed to customers replaced a 60-w lamp, revenue gained paid for the survey in less than six months, he stated.

Low Use Customers Productive

According to Elizabeth Parker, home service division director, Georgia Power Co., individual contacts with low use customers is highly productive. Prospects from low use calls run from 45 to 47 percent of those developed by Home Service in the Company's Columbus Division. Calls on low use customers constitute 33 to 40 percent of the personal contacts made in that Division, Miss Parker said. From prospects developed last August, the company sold 17 appliances to new users: seven ranges, three refrigerators, two air conditioners, one dishwasher, one automatic washer, and three home freezers. Replacement sales included two water heaters and one range, plus dealer sales of three ranges, two home freezers and two air conditioners, she said.

All Electric Rate

Three years of results with an "All Electric" Rate Schedule have been most encouraging, said H. A. Stroud, promotion manager, Monongahela Power Co., not only in water heater sales, but in house heating, ranges, laundry dryers and in other appliances. These results have improved over anything the company has ever experienced, and kilowatt-hour growth has reached new highs, he declared. Water heater sales have increased from three to five hundred new installations a year to the present 1800 to 2000 per year. Range sales have increased 15 percent; dryer sales have almost doubled—from 3500 new installations to over 6000; and house heating from 11 on January 1, 1956 to 669 today (17 heat pumps and 662 resistance installations). Over 90 percent of these electric house heating installations are located where natural gas is available and degree days vary from 4800 to 6500, Stroud said.

Water Heater Sales Future

The one biggest way to change the estimated water heater sales for the future is to go to the quick recovery type, according to R. H. Hunt, market research and development dept., Hotpoint Co. Just as soon as the other utilities take similar action to that of the American Electric Power Service Corp. (which has adopted a 50-gal. heater with two 4500-w elements interlocked so that both will not come on simultaneously), the manufacturers will be in a position to streamline their facilities to a point where electric water heaters can be priced more competitively, Hunt declared. He pointed out that Hotpoint manufactured 932 different types of water heaters in 1958, because of the many wattage combinations as well as sizes.

Selling Medallion Homes

John A. Reed, general sales manager, Southwestern Electric Power Co., reported that his company's Medallion Home promotional program resulted in the completion of 210 Medallion Homes in 1958 and 1959. He said that a four-months test campaign of a promotion called "Operation Built-in" launched August 1, 1958, was so successful that it was extended to the end of 1959. In this campaign, the company paid the home builders cash promotional allowances for the installation of certain built-in electrical equipment. From August 1958 through the first nine months, the company paid a total of $81,677 to builders for the following built-in equipment: 1100 100-amp built-in ranges, 1294 clothes dryer outlets, 67 electric water heaters, 756 2000-w lighting installations, 1235 240-v outlets and 49 heat pumps. These results were obtained in the face of a competitive situation whereby gas equipment was offered at greatly reduced prices, Reed declared.

Employees Cash In

Virginia Electric and Power Co.'s "Housepower Special" campaign was described to the Conference by C. E. Anderson, sales promotion manager.

Residential Sales Committee chairman and speakers (l to r) Chairman C. E. Anderson, manager, sales promotion, Virginia Electric & Power Co.; Miss Elizabeth Parker, director, home service division, Georgia Power Co.; J. H. Jensen, director, Academy of Lighting Arts, General Electric Co.; Charles J. Sinnott, general sales manager, New Orleans Public Service, Inc.; and H. B. Hicks, manager, residential and rural sales, Carolina Power & Light Co. At right above, conferring in New Orleans, are: Farm Power Sales Committee chairman and speakers (l to r) Chairman, S. John Folks, Jr., supervisor, community and rural development, Florida Power Corp.; Roy McCraney, rural engineer, Georgia Power Co.; Don Adams, director of agricultural development, Florida Power & Light Co., and Albert L. Morris, Jr., associate editor, "Electricity On the Farm"

VEPCO employees furnish leads for authorized electrical contractors to make free home wiring check-ups after talking to their friends, neighbors and relatives. Thirty-three cash prizes were paid to employees in all districts for leads submitted and points awarded, he said. One out of every five wiring check-up ratings resulted in rewiring jobs and 90 percent of these were 100 amp or more. Anderson declared.

Heating With Light

Commercial and industrial lighting is becoming a major factor in electric heating, R. T. Dorsey, supervisor, commercial lighting applications, General Electric Co.. told the conference. Today's footcandle standards provide a large part of the heating needs, he said, and makes other forms of electric heating widely applicable. Ventilation methods combined with lighting can substantially reduce cooling requirements and can nearly double lighting levels without increasing refrigeration tonnage. This will become more and more important in coping with summer peaks, Dorsey stated.

In the opinion of Joe B. Browder, sales manager, Georgia Power Co., the new foot-candle levels are such that even with "cool and efficient fluorescent," the heat generated is sufficient to heat a building with a design temperature of 10 F with the lighting system being the sole source of heat. Harry T. Yop presented the paper for Mr. Browder. A study made of the design of the new Georgia Power Co. Office Building in Atlanta evolved the following interesting conclusions: (1) When the new foot-candle levels are applied to a typical office structure, the average level of light is 100 ft-c, even though the specific applications vary from 30 to 200 ft-c: (2) The fluorescent wattage required to produce this level and stay within acceptable brightness ranges was 8 w per sq ft; (3) The lighting system provides 27 Btu per sq ft which is available for heating; (4) Thirty-six Btu per sq ft was found to be needed for air conditioning.

Electric Vs Gas Kitchens

In comparing the economics of electric and gas commercial kitchens, R. L. McCuen, commercial sales supervisor. Duke Power Co., said that although the first cost and installation of the electric equipment is 50 to 75 percent higher than gas, and, in most cases the operating cost for gas is lower, electric utilities must sell the following intangible advantages of electricity.

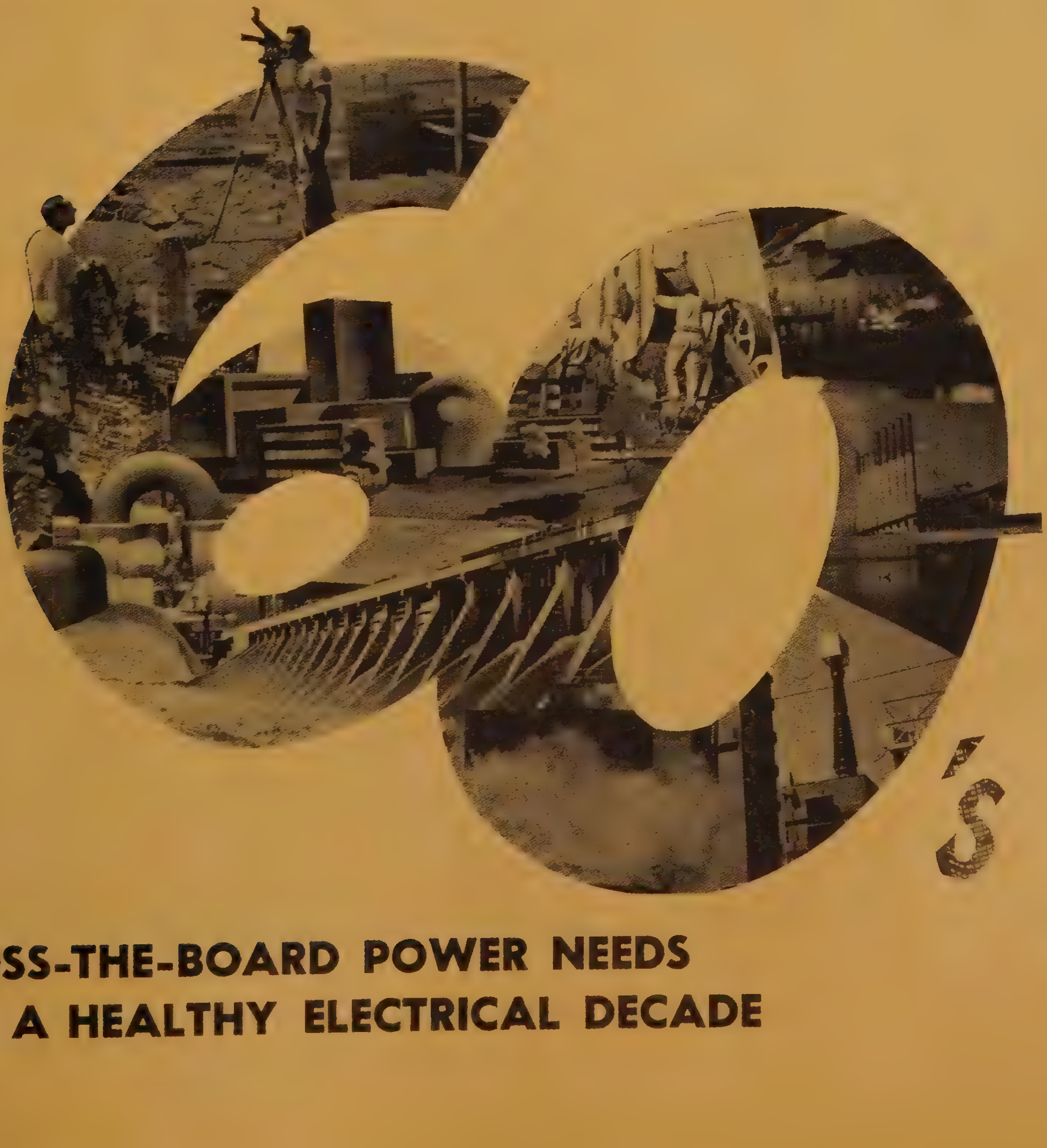
L. V. Dugas, superintendent of industrial and commercial sales, Gulf States Utilities Co., described his company's successful 16-point program for selling commercial electric cooking in an area of abundant low-cost natural gas fuel. He said that an addition of over 8,000 kw in commercial cooking load is anticipated by his company in 1959, bringing the total to more than 43,000 kw—bringing in more than $1-million in annual revenue.

Sales Plans for 1960 are discussed by Conference Chairman, C. M. Wallace, Jr., vice-president—sales, Georgia Power Co.; J. S. Gracy, vice-president, Florida Power Corp.; H. L. Cushing, commercial manager, Appalachian Power Co., and Allan C. Mustard, vice-president, South Carolina Electric & Gas Co. In the photo at right below are the Advertising Committee chairmen and speakers (l to r) R. J. Wimberley, manager, advertising and sales promotion, Arkansas Power & Light Co.; Chairman O. K. LeBlanc, sales promotion and advertising manager, Louisiana Power & Light Co.; C. M. Kilian, advertising manager, Alabama Power Co.; Ralph Zeuthen, manager, Live Better Electrically Program, Edison Electric Institute, and vice-chairman G. Fred Cook, Jr., manager, public relations, Virginia Electric & Power Co.

EL and P

ELECTRIC LIGHT and POWER

THE SOARING



ACROSS-THE-BOARD POWER NEEDS SPELL A HEALTHY ELECTRICAL DECADE

EEI REPORTS ON 1959 ELECTRIC UTILITIES

BY ALLEN S. KING

President, Edison Electric Institute, and President, Northern States Power Company

EEI Reports 1959 Electric Power Milestones

- **Kwh Production: 790 Billion**
- **U. S. Capability: 165-Million Kw**
- **U. S. Kwh Sales: 625-Billion**
- **Domestic Use (avg.): 3550 Kwh**
- **Coal Consumption/Kwh: 0.89 lbs.**
- **Taxes Paid by Investor-owned Companies Passed $2.12-Billion Mark**
- **Electric-plant Investment Was 10% of All U. S. Business Investment**
- **Electric Utilities' Investment: (Private): Now Over $43-Billion**

CHART DATA: Sources are EEI, U. S. Govt. Agencies and Engineering Consulting Firms; Extrapolations are made by EL&P.

ONTINUE IMPRESSIVE GAINS

Key indices of electric-utility performance show substantial growth for 1959 over 1958

CONTINUING TO ADVANCE in 1959 as the world leader in elecric power, the electric utility industry n the United States scored impressive ains in output and a record addition o power capability, despite the proonged steel strike.

In 1959, preliminary figures show hat all components of the electric utilty industry generated a record 707 illion kwh, an increase of 62 billion wh, or 9.6 percent, over 1958 producion. With the addition of railway and ndustrial generation, but excluding ower used or lost within generating tations, total electric production for he nation during the year was 790 illion kwh.

In generating capability, the electric tility industry reached a new high of 65 million kw by the end of the year, record increase of 15.3 million kw, or 0.3 percent, over the 1958 figure. The ation's total electric generating capaility, including railway and industrial lants, was 183 million kw.

A good indicator of a nation's total productive capacity and the well-being of its people is kwh use per capita. For the United States in 1959, this was 4481 kwh.

There was a record increase in capability of 15.3 million kw on the nation's utility systems during 1959. Of the total increase, 11.8 million kw were on systems of investor-owned electric companies, and the remainder on systems of government agencies. The new additions increased America's electric utility generating capability to 164.8 million kw at the end of 1959, 10.3 percent higher than the 149.5 million kw for 1958.

With a 1959 peak demand of 129.3 million kw, the industry had 35.5 million kw of reserve capability, or a 27½ percent margin of capability over demand. The reserve alone was larger than all of the 1958 generating capacity of Great Britain, the third-ranking nation in power supply.

Construction expenditures by the electric companies in 1959 were $3.5-billion, their third largest expenditure on new plants and equipment. This brought the companies' total investment in plants and equipment to more than $46-billion at the end of the year.

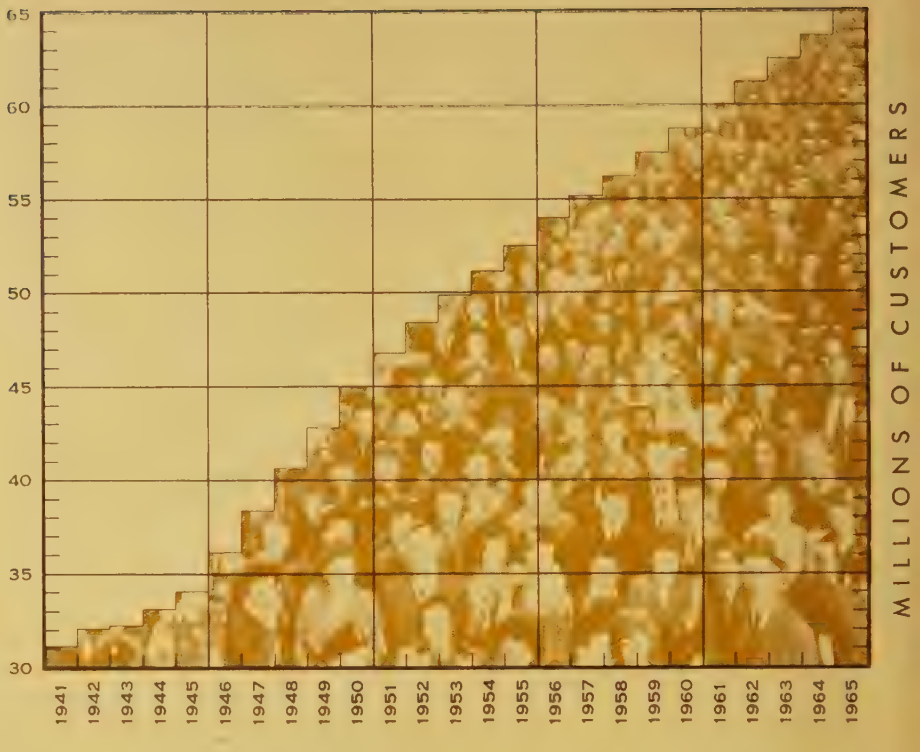
For 1960, expenditures by the electric companies for new construction are expected to be about $3.4-billion. About 11.9 million more kw of new generating equipment will be added in 1960—the electric companies installing 9.3 million, and governmental agencies, 2.6 million.

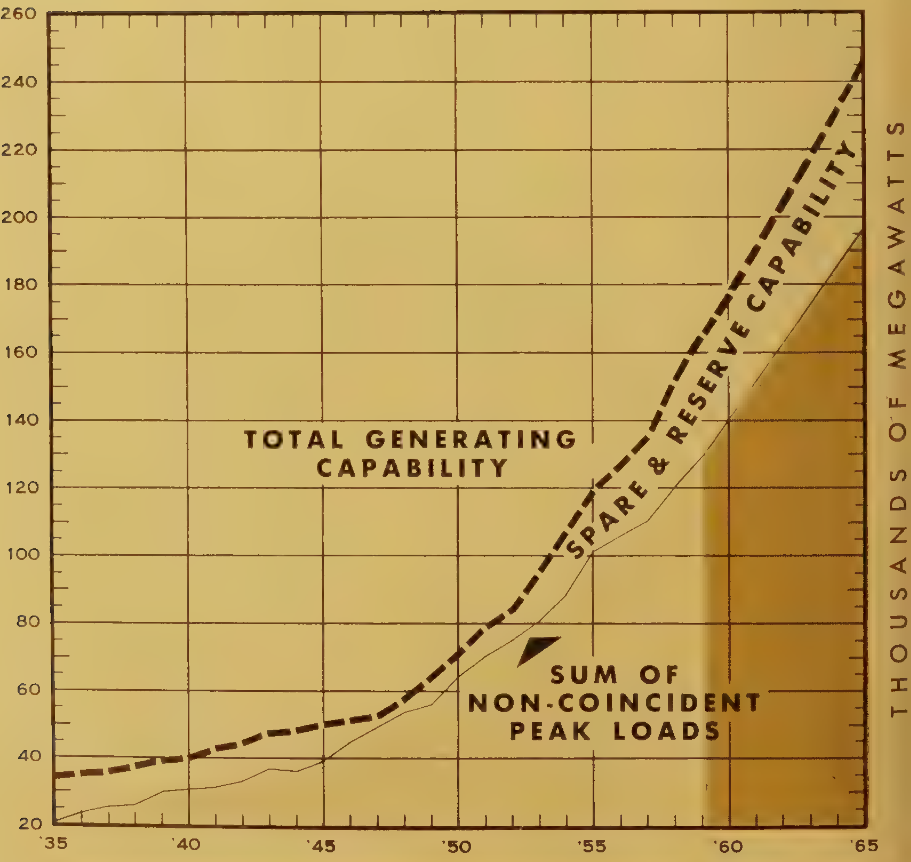
Record Week

In attaining new highs in sales and customers, the electric industry established late in December a new record for weekly output of 14.2 billion kwh, exceeding a record week late in August by less than 100 million kwh. The 14-billion-kwh mark was established for the first time in August, reflecting the increasing importance of air conditioning.

As an indication of the magnitude of power output in the United States, the output of the record week and the near-

CUSTOMER GROWTH RECORD





CAPABILITY vs DEMAND

record week preceding it was more than Communist China's electric output of 27.5 billion kwh for the entire year of 1958.

Sales and Customers

Sales of the electric industry in 1959 reached a new high of 625 billion kwh and were classified as shown in Table II.

About 1.3 million customers were added in 1959, bringing the total at the end of the year to 57.5 million. Over 85 percent of these new customers are residential.

Home Use of Electricity

The use of electricity in the Ameri-an home continued its rise, reaching a new high of 3550 kwh as the annual average. This is 184 kwh over the previous record in 1958. Residential demand s expected to keep advancing at its present rate, and use of from 6500 to 7000 kwh per home consumer by 1969 s anticipated.

Revenues Up

Gross revenues of the nation's investor-owned electric companies in 1959 were $9,150-million, 8.2 percent higher than the previous record of $8,454-million set in the recession year of 1958. Net income was $1,670-million in 1959, 9.0 percent greater than the 1958 figure of $1,532-million.

Taxes Exceed $2-Billion

The investor-owned electric companies continued as a prime source of tax money, with anticipated payments for 1959 amounting to $2,120-million going to all levels of government, Federal, state and local. This figure is $157-million greater than the tax bill for the preceding year.

As the companies' largest single item of expense, the 1959 tax bill was equivalent to 23.2 cents out of each dollar of gross revenue. Federal taxes took 58 percent, while state and local accounted for 42 percent.

For 1959, the electric companies paid out in wages and salaries $1,570-million, an increase of five percent over the 1958 figure of $1,494-million.

Another important expense item was fuel. In 1959, fuel cost the electric companies $1,420-million, a 5.9 percent increase over 1958.

Value of Electric Service

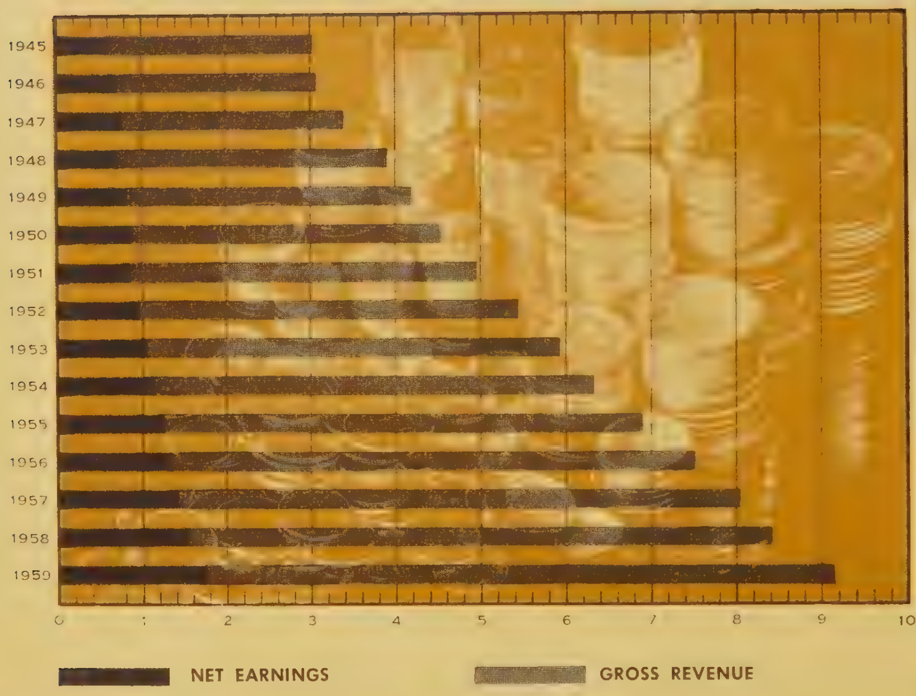
Inflation continued as one of the nation's most serious problems, and this was reflected in the Consumers' Price Index, which moved to a new high of 125.5 in October, 1959 (1947-49=100). In contrast, the average revenue per kilowatthour sold to home consumers maintained its steady decline. In 1959, average revenue was 2.51 cents, down from 2.53 cents in the previous year.

Electricity's place in the family budget is very small, despite the many services it performs and the steadily increasing quantities being used. Latest available figures (1958) show that an average of only nine-tenths of one per-

ELECTRIC UTILITY STATISTICS

PRIVATE COMPANIES	*1959 Estimated*	*1958 Preliminary*
Gross Revenues	$9,150,000,000	$8,454,000,000
Net Income	1,670,000,000	1,532,000,000
Electric Operating Income	2,060,000,000	1,864,000,000
Non-Operating Income	69,000,000	59,000,000
Income from Other Departments	182,000,000	162,000,000
Operating Expenses	3,920,000,000	3,715,000,000
Taxes	2,120,000,000	1,963,000,000
Total Electric Utility Plant (December 31)	43,000,000,000	39,700,000,000*
Construction Expenditures	3,500,000,000	3,800,000,000*
TOTAL ELECTRIC POWER INDUSTRY		
Energy Generated by Fuel (million kwh) (Steam and Internal Combustion)	653,000	581,000
Energy Generated by Hydro (million kwh)	137,000	143,000
Total Generation (million kwh)	790,000	724,000
Energy Sold to Consumers (million kwh)	625,000	569,000
Generating Capability December 31 (mw)	165,000	149,000*
Fuel Consumption (coal or equivalent—tons)	254,000	228,000
Number of Residential Customers December 31	49,000,000	47,800,000*
Average Residential Use per Year (kwh)	3,550	3,366*
Average Cost per Kwh for Residential Use	2.51¢	2.53¢*

*—means *final* figure



GROSS REVENUE AND NET EARNINGS
(MILLIONS OF DOLLARS)
OF THE POWER COMPANIES

TABLE I

The Electric Power Picture
United States vs. Russia

Criterion	U.S.	U.S.S.R.
Total Production in 1959	790 billion kwh	244 billion kwh
Hydro Production in 1959	152 billion kwh	50.7 billion kwh
Generating Capability in 1959	183 million kw	59 million kw
1965 Goal For Generating Capability	245 million kw	110-112 million kw
Nuclear Power Facilities Underway	16 plants—1.4 million kw—$570-million	5 plants—465,000 kw
Power Use Per Capita in 1959	4481 kwh	1161 kwh
1965 Goal For Use Per Capita	6000 kwh	2100 kwh
Average Home Use In 1959	3550 kwh	400 kwh
Power Used For Industrial Purposes	48% of Total	80% Total
Kwh Used For Industrial Purposes	70% greater in U.S. than in U.S.S.R.	

TABLE II

The Electric Industry's Sales Record

Customer Classification	1959 Sales (Billion Kwh)	Percent of Total	Billion Kwh Increase Over 1958
Large Industrial	303	48.4	28
Residential	172	27.6	13
Commercial	112	17.9	11
Other	38	6.1	4
Total	625	100.0	56

cent of each dollar spent by American families living in cities went for electricity.

Rate Increases and Inflation

Regulatory Commissions continue to recognize the effects of inflation in practically all aspects of operational and capital costs, and the necessity for the financial strength essential to the provision of adequate electric service.

From 1946 through the first 11 months of 1959, according to EEI tabulations, there were 577 applications for rate increases, involving 223 companies. Of the 577 applications, 515 were granted, 27 are pending, 13 were withdrawn, and 22 denied. The 1959 record to December 1 shows 48 actions. Thirty-one increases were granted, one was denied, and 16 of the 1959 applications are still pending.

L B E Program Growing

EEI's live Better Electrically Program is scheduled for 1960 with an estimated budget of $2.5-million. A otal of 141 member companies will ake part in the program, including even members participating for the irst time.

The 1960 advertising features the ompetitive selling theme line, "Elecricity Is Your Better Way to Cook, Heat, Cool, etc.," with emphasis on Housepower, lighting, the Medallion Home, major load-building appliances nd electric house heating.

The media budget will be concenated in consumer magazines to achieve reater frequency and impact in 1960.

Some Predictions for 1960

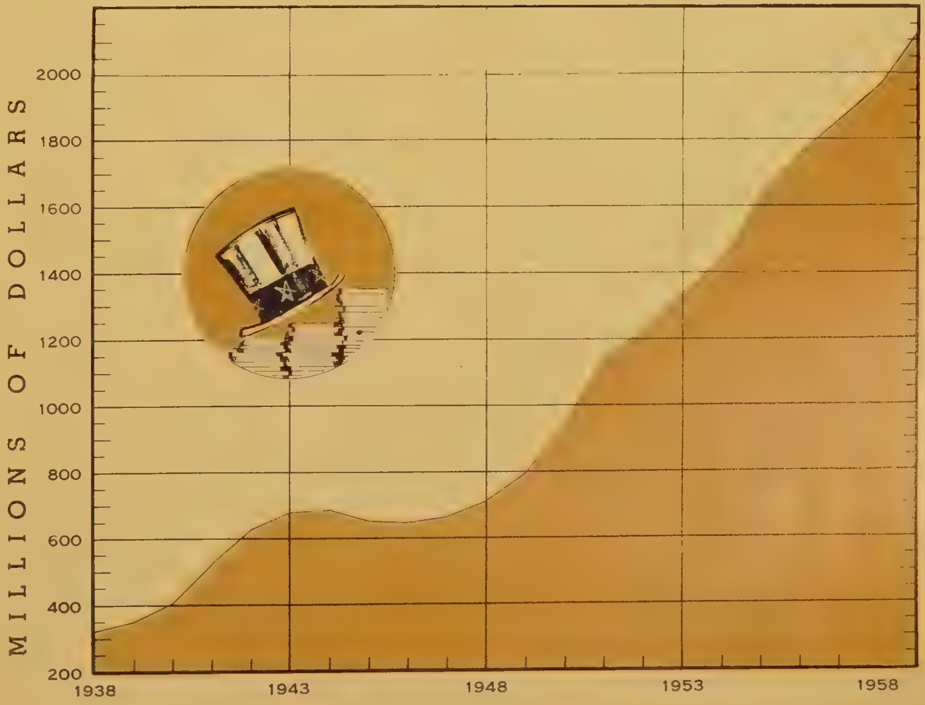
Looking ahead to the next 12 months, the electric industry is planning and working towards establishment of new records in generating capability, production, sales and revenues.

By the end of 1960, the total generating capability of the electric industry is expected to be advanced 7.2 percent over 1959, to reach 176.7 million kw. Electricity production is expected to be 7.7 percent higher than the preceding year, with 1960 generation totaling 761 billion kwh. Sales by all parts of the industry will advance 8.0 percent to a new peak of 675 billion kwh. Customers will reach a total of 58.7 million. Revenues of the investor-owned electric companies should be about seven percent greater than in the preceding year, totaling about $9.8-billion for 1960.

YEARLY TOTAL OF TAXES

IN MILLIONS OF DOLLARS

PAID BY INVESTOR-OWNED ELECTRIC UTILITIES



THE SOARING POWER USE: MORE THAN TWICE AS MUCH!

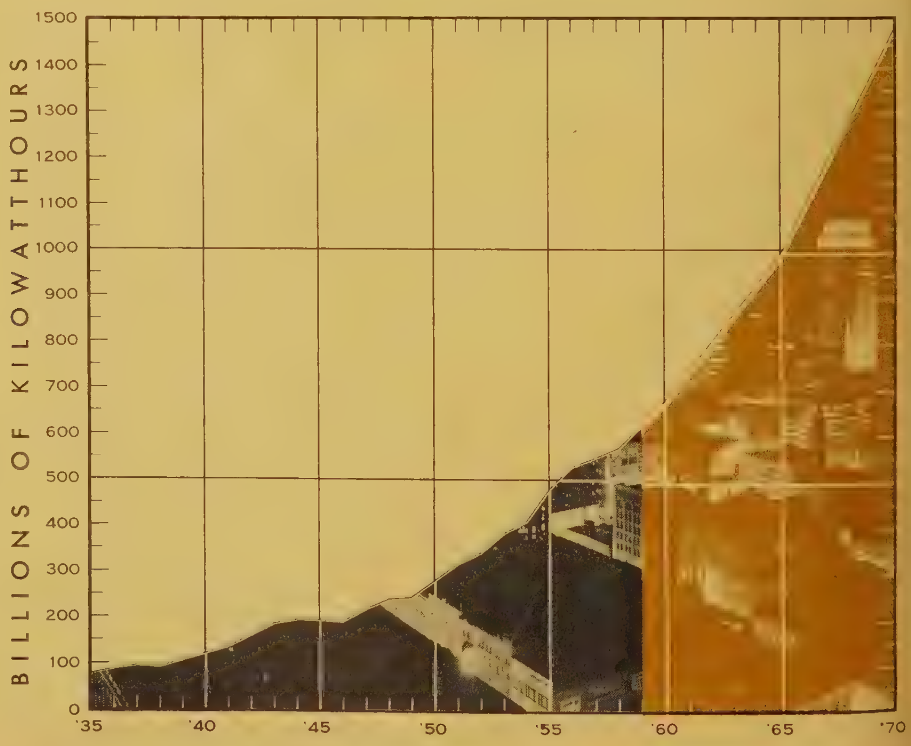
AMERICA CONTINUES its heavy appetite for electric power, and all industry growth indicators show this appetite getting keener. EL&P predicts that electric power use by all classes of customers will more than double itself during the '60's. Established trend lines, when projected, show slightly greater than a 120-percent growth during the coming decade.

Following pages show and examine trends in residential, industrial, commercial, farm, street and highway lighting, and in regional growth. Growth contributions from these categories should help this year's total energy sales surpass those of 1959 by more than 8.6 percent.

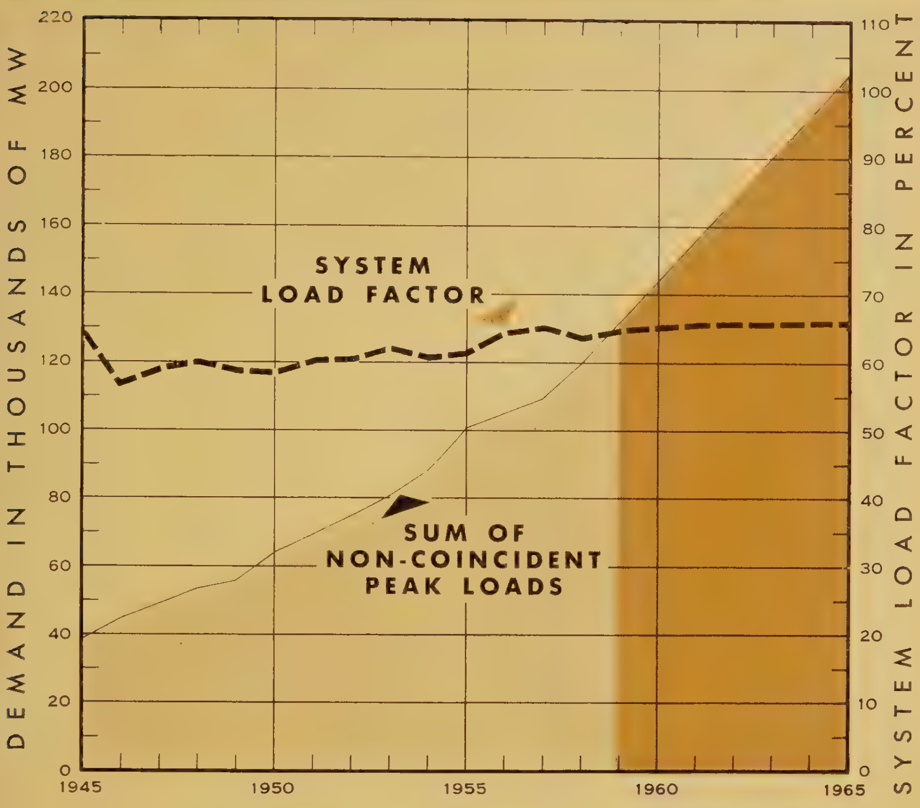
All projections assume that there will be no major depressions or shooting wars during the period under study.

SALES OF ELECTRICITY

OF ALL UTILITIES PUBLIC AND PRIVATE TO ULTIMATE CONSUMERS



DEMAND AND AVERAGE U.S. LOAD FACTOR



Competition Continues Keen

GAS COMPETITION continues its look to a heavy future growth, according to American Gas Association forecasts.

Total gas customers (including residential heating and cooling, other residential, commercial, industrial and other) are expected to grow from 31,242,000 in 1958 to 44,460,000 in 1970. Greatest growth is expected in residential heating and cooling customers—almost 88 percent from 1958 to 1970.

Clouds on the electric load-building horizon continue to be formed by the gas industry. Its big target is the residential load. With complete lines of gas appliances and the Blue Star Home program, the gas industry can whack away at almost 90 percent of the energy requirements in the home. (EEI estimates that an all-gas house uses 1500 kwh for lighting and small appliances, representing $52 per year for electric revenue. They estimate that an all-electric house uses as much as 25,000 kwh with an annual electric bill of $425.) The gas industry, with an advertising and promotion campaign totalling $30-million (combining local and national expenditures) is designed to capture a larger share of the residential market. Most of the leading gas-stove manufacturers have signed up in the Gold Star range program, and it is anticipated that other gas appliances will eventually carry the Gold Star label.

Gas people are not asleep to the trend toward more completely controlled home equipment, either. Just one example is a new control system for gas range ovens recently made available. A single dial handles starting and stopping of all operations, and, in addition, permits holding a meal at exactly the desired degree of "doneness" without continued cooking.

Projected gas sales to ultimate customers are expected to go from 80,285 million therms in 1958 to 162,000 million therms in 1970. Greatest growth in therms is expected in the commercial category—about 150 percent overall.

While 1958 saw 571,500 miles of transmission and distribution mains of pipelines and distribution companies in the United States, by 1970 the country will be laced with 911,500 miles of gas mains, almost a 60-percent increase. Just the coming year alone will see 139 American cities receiving new or additional supplies of natural gas, according to a survey compiled by the Gas Appliance Manufacturers' Association.

Residential Use Should Grow at Nine-Percent Rate

RESIDENTIAL SALES—which accounted for 27.6 percent of total 1959 electric industry—are slated at 8.4-percent gain and will have totalled 172.4 billion kwh in 1959. Longer term EL&P projections show sales increases are expected to average 9 percent per year during the '60's, with 1960 total sales predictions of 188 billion kwh, 1965 sales at 290 billion, and 1970 sales at 447 billion kwh.

Residential customers are expected to total 48.8 million at year-end 1959, which is a 2.3-percent increase over 1958. At year-end 1960, more than 50 million residential customers should be served by electric utility lines. On a long-term basis, 1965 and 1970 should see 56 million and 62.2 million customers, respectively. This is approximately a 2.2-percent rate of growth per year.

Kwh sales per residential customer should total 3567 in 1959—201 kwh per customer up from 1958 figures. In the last five years, residential sales per customer have averaged a 6.9-percent increase and are predicted to continue at a 6.6-percent rate during the '60's, totalling 3802 kwh in 1960, 5237 kwh in 1965, while in 1970, sales per customer are estimated to be 7262 kwh.

Average price per kwh paid by residential customers has been calculated to be 2.51¢ in 1959; in 1960, 2.48¢; in 1965, 2.38¢; and in 1970, 2.30¢.

Average annual bills in dollars per customer are shown on the graph on page 82. Projected annual bill in 1970 is $167.03.

Factors which will contribute to continued increased sales include gains in per capita income and increasing household formations in an ever-expanding economy. (When averaged for the first 11 months of 1959, the seasonably adjusted annual rate of non-farm housing starts in 1959 amounted to 1,343,000.) In addition, the year-round electric heating and cooling load will continue to contribute materially to increasing residential loads.

All-out efforts planned by utilities and manufacturers to promote load in the future will contribute substantially to increased power use. Effects of previous programs are already being felt by manufacturers of wire, cable and service entrance equipment. They have noticed a distinct trend from 60- to 100-amp services, and in many cases to 200 amp. Still challenging load builders, however, are at least 20 million homes in need of electrical modernization. And, they are occupied by people who have the financial means to up-date their kitchens, laundries, and wiring.

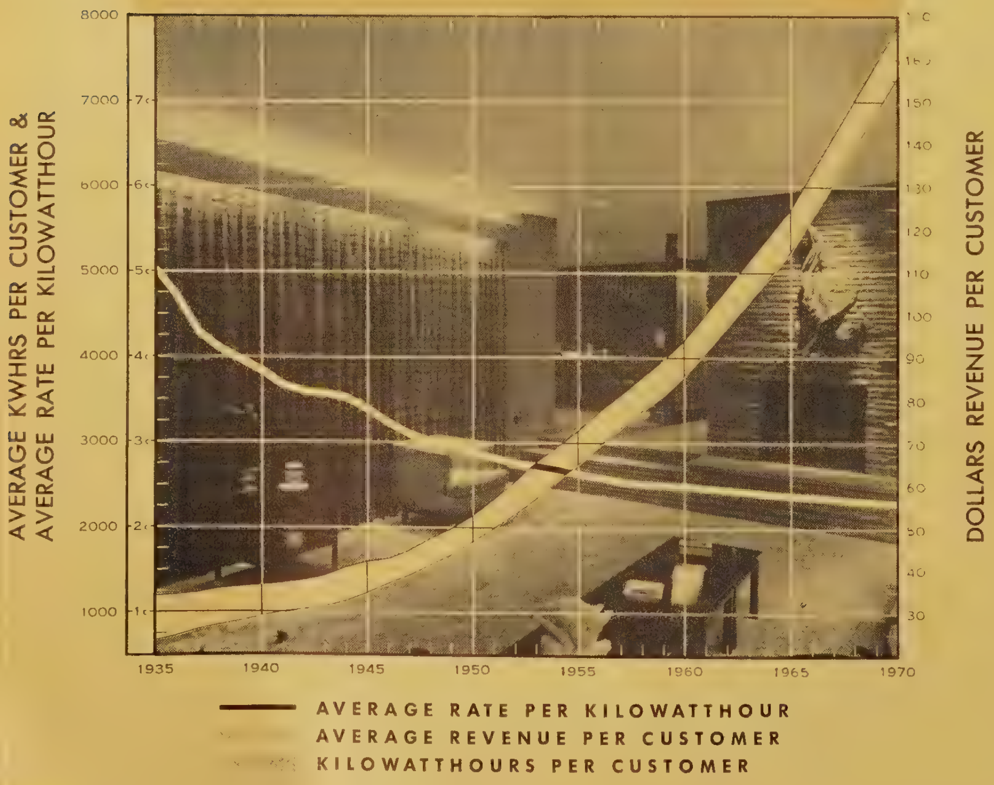
EL&P sticks with its last-year's prediction that there will be 1,800,000 completely electrically-heated homes in 1965, compared with slightly more than 600,000 now. EL&P predicts that by 1970 there should be 4.5 million electrically-heated homes.

ELECTRIC POWER USE: RESIDENTIAL
(Kwh in millions)

1930	11,018	1949	58,139	1956	133,851
1935	13,978	1950	67,030	1957	147,059
1940	23,317	1951	77,024	1958	159,047
1945	34,184	1952	86,780	1959	172,400*
1946	38,571	1953	97,063	1960	188,000*
1947	44,171	1954	108,465	1965	290,000*
1948	50,978	1955	120,524	1970	447,000*

** estimated*

RESIDENTIAL ELECTRIC SALES NATIONAL AVERAGE



Industrial Use "Snapped Back"

Construction, Modernization Commercial Growth Keys

INDUSTRIAL kwh sales in 1959 prior to the steel strike had grown by an annual rate of 9.2 percent, based on data from Class "A" and "B" companies. At press time, the exact effect of the steel strike and the resulting speed-up in production in December following the return to work in the steel mills is uncertain.

In any event, the "snap back" in 1959 industrial sales from recession doldrums was an unqualified success. Estimated sales by utilities to industrial customers should total 299 billion kwh in 1959, an increase of 24 billion kwh over 1958, the only year in the '50's to be recorded as one in which kwh sales to industrial customers decreased.

Long-term trends indicate that utility sales to industrial customers should grow at an average rate of 8.1 percent per year in the next decade. 1960 sales should total 323.1 billion kwh, those in 1965 and 1970, 477 and 705 billion kwh, respectively.

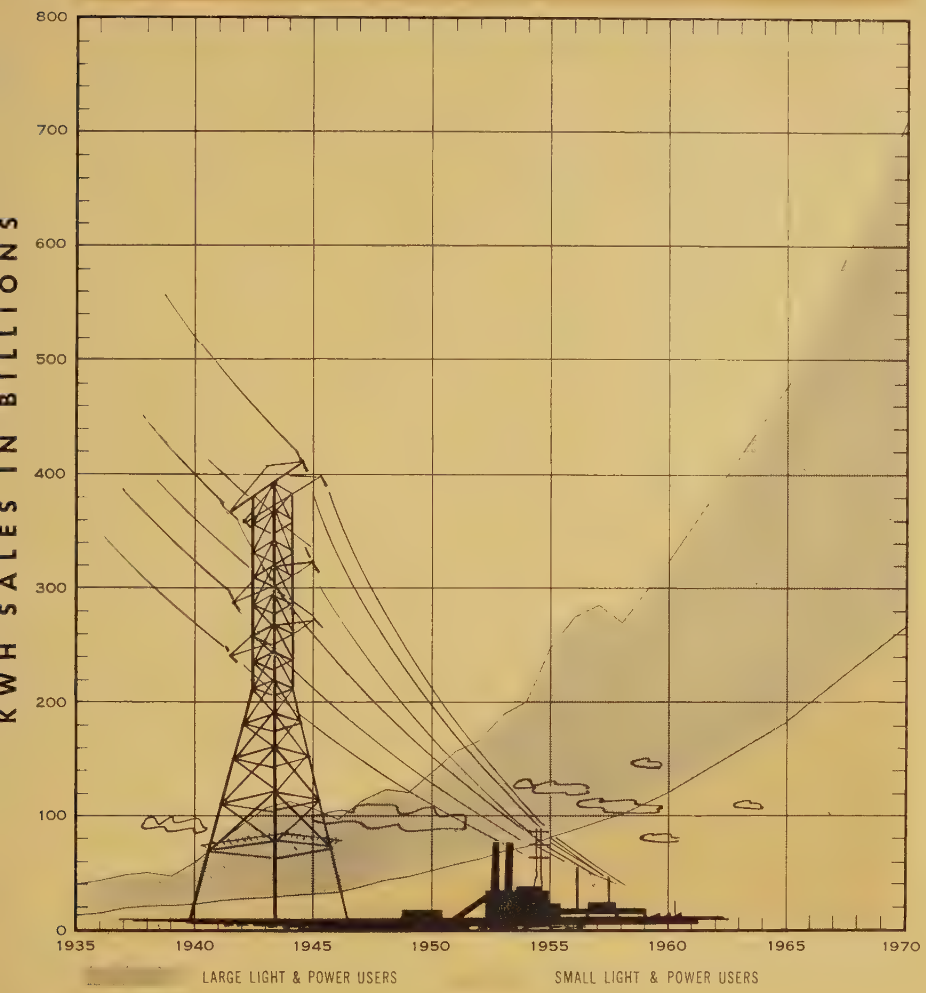
Industrial kwh used per worker continue to reflect increasing use of electric automation in industry. On a total basis, use per production worker is expected to reach 50,000 kwh by 1970, or nearly double the 1958 figure of 25,032 kwh per worker.

These projections of use per worker include all power use including electricity used in the reduction of aluminum and magnesium, and Atomic Energy use. These particular uses have high per-worker consumptions.

If the kwh consumed by these uses are excluded from the per-worker use calculations, a more stable trend results. The total kwh per worker for manufacturing workers (excluding AEC, aluminum and magnesium reduction) should reach 28,200 kwh by 1965 and 36,800 kwh per worker by 1970. This compares with an average use of 19,385 kwh per worker in 1958.

Electric energy continues to be a low-cost servant for industry. The average price paid per industrial kwh in 1958 was 0.95¢. The 1959 average rate is expected to remain near this level. For comparative purposes, the trend of gross hourly earnings of manufacturing employment is also shown in the accompanying graph.

INDUSTRIAL AND COMMERCIAL GROWTH



THE '60's SHOULD experience continued good increases in commercial power use. During the '50's, sales increased by an average of 9.2 percent per year and customer increases averaged 1.5 percent per year. In the early postwar years (1945-50), sales had averaged a 10.6 percent increase per year; however, a 4.4 percent per year increase in commercial customers contributed substantially to the kwh sales increases in this category during this period.

Last year's sales should total 111.5 billion kwh and reach 120.8 billion kwh by this year's end. Over a longer term, EL&P predicts that sales will increase to 269 billion kwh by 1970.

Use per commercial customer grew more rapidly (7.4 percent) in the '50's than in the 1945-50 period of immediate postwar growth (5.6 percent). Commercial use per customer—at the 17,600-kwh level during 1959—is predicted to reach 25,790 kwh by 1965, and 35,657 kwh by 1970.

Factors which support continued commercial growth include the following: continued development of new shopping areas (new commercial construction in 1960 is expected to exceed $55-billion), modernization of lighting (at present, only 15 percent of the 2½ million retail stores and service markets in the country have adequate illumination), continued installation of air conditioning in existing facilities, school modernization and expansion, and new construction.

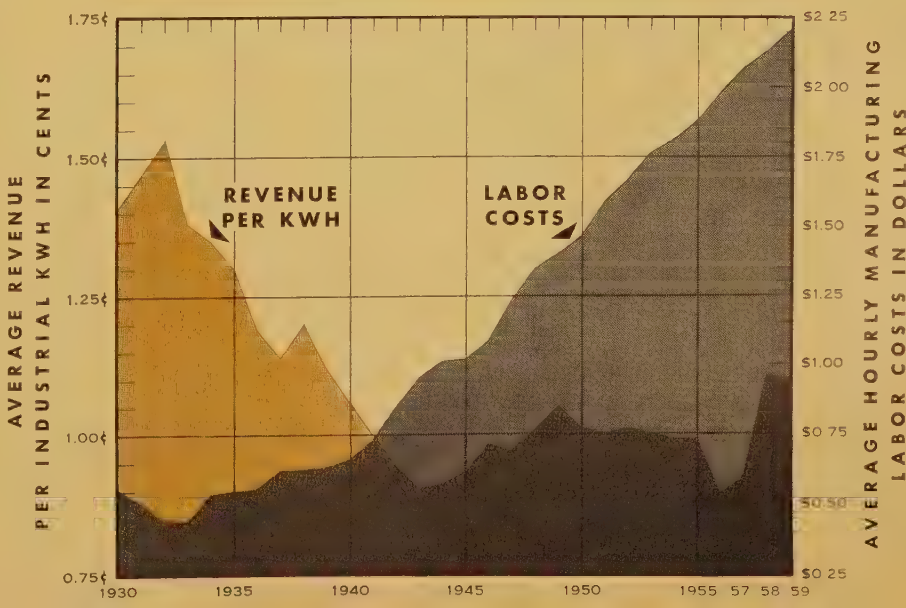
Farmstead Efficiency Needs Mean Increased Power Use

DURING THE '50'S, use of electricity per farm in the United States has grown at a slightly faster rate than either residential or commercial use per customer. However, many agricultural authorities consider that power use on the Nation's 4.6 million farms is only now on the brink of an even greater increase.

Summed up, the reasoning behind this feeling seems to be that the modern farm home has an equal opportunity for the load growth experienced by the residential class (early in 1959, 80 percent of farm load was in the home, and 20 percent in equipment), and that the many items of large-use equipment that are achieving wide acceptance will multiply electric power use on the farmstead. Such items include electrical equipment for water pipe thawing, crop drying and aeration, milking machines, welders, seed treatment and cleaning, poultry and swine brooding, hay treatment (including pelletizing and wafering), and for feed and materials handling.

Farm population shrank from 26 percent of the country's total in 1933 (32.4 million) to 12 percent in 1958

THE Kwh—AN INDUSTRIAL BARGAIN



(20.8 million). More power for mechanization will be needed because of the trend to larger farms.

EEI farm-load statistics are divided into two classifications—those farms east of the 100th Meridian where little or no irrigation is involved and western farms where irrigation may be involved. Power use for irrigation fluctuates greatly with weather conditions; hence, no use projections have been attempted for this classification.

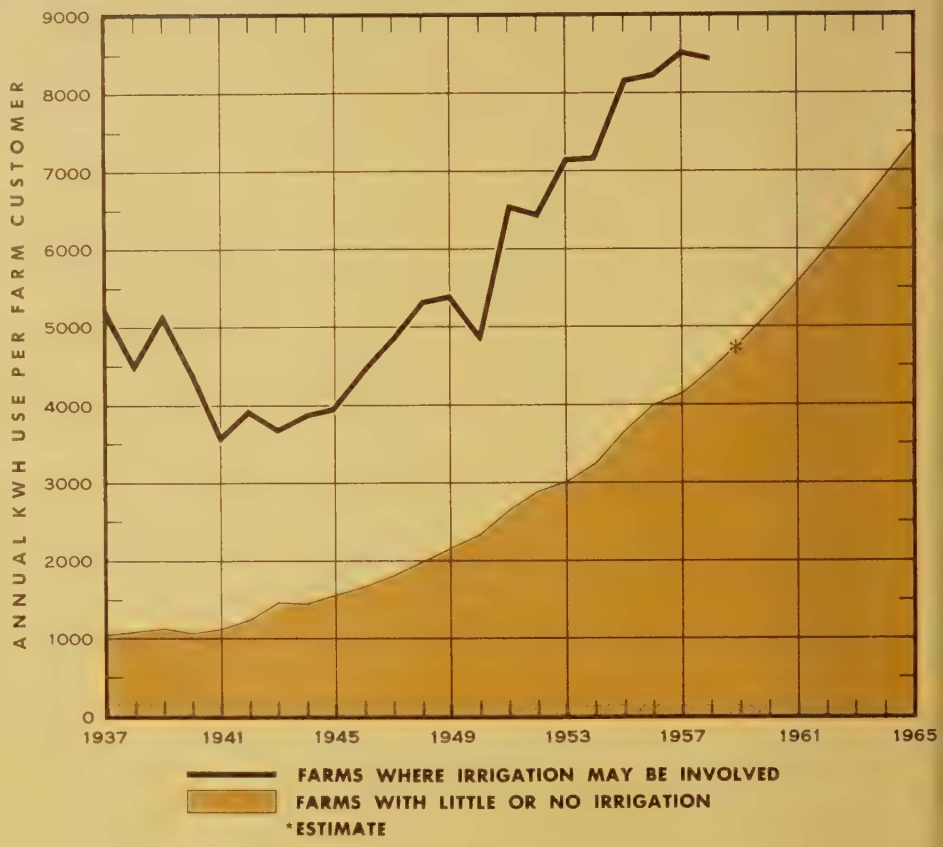
For farms with little or no irrigation, 1959 use is estimated to total 1750 kwh, for a 7.3 percent increase. Use by 1965 should reach at least 7400 kwh per farm.

A challenge to utilities who serve farm load: At the 1959 Winter Meeting of the American Society of Agricultural Engineers, Donnell R. Hunt, associate professor of agricultural engineering, Iowa State University, Ames, said, "Within the last ten years, the place of the farm crop dryer has risen from obscurity to significance. Farmers now recognize artificial drying as economically beneficial in reducing harvesting losses, reducing harvesting time, and retaining the quality of the harvested crop.

"Conventional heated-air farm-crop dryers use a fan to produce air flow and a fuel burner to add heat to that air flow. With recent demands for increased drying capacity, internal combustion engines are being used to power the fan instead of the formerly used electric motors, since *there is limited electric service available on most farms.* (Italics ours.) In most cases, the farm tractor is used as the fan power unit."

Farm kwh hunters still face an "open season" on the following problems: improvement of inadequate wiring practices and devices used; improved design for more efficient operation of machines; and difficulties in unloading grass, forage, and shredded silage.

FARM CUSTOMER POWER USE



Street and Highway Lighting Growth
(Kwh in millions)

1930	2,227	1949	2,725	1956	4,738
1935	2,078	1950	2,976	1957	5,090
1940	2,048	1951	3,285	1958	5,505
1945	2,184	1952	3,522	1959	5,960*
1946	2,272	1953	3,780	1965	9,510*
1947	2,365	1954	4,042	1970	14,106*
1948	2,525	1955	4,373		

* *estimated*

DURING THE '50'S, kwh sales to street and highway lighting customers have exhibited a most stable growth trend. During the first five years of the decade, the sales growth averaged 8.0 percent per year. During the last four years, from 1955 through 1959, sales have increased to 8.1 percent per year growth rate.

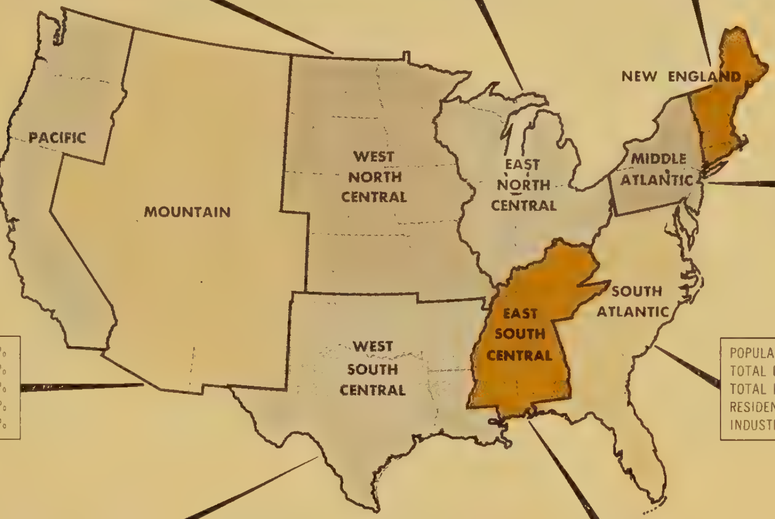
Street and highway lighting sales are expected to total 5960 million kwh in 1959, 6440 million kwh in 1960 and 14,100 million kwh in 1970.

REGIONAL GROWTH 1948-1958

POPULATION	10%
TOTAL ELEC CUSTOMERS	32%
TOTAL KWH SALES	128%
RESIDENTIAL KWH SALES	199%
INDUSTRIAL KWH SALES	102%

POPULATION	21%
TOTAL ELEC. CUSTOMERS	30%
TOTAL KWH SALES	126%
RESIDENTIAL KWH SALES	178%
INDUSTRIAL KWH SALES	116%

POPULATION	9%
TOTAL ELEC CUSTOMERS	20%
TOTAL KWH SALES	84%
RESIDENTIAL KWH SALES	158%
INDUSTRIAL KWH SALES	46%



POPULATION	30%
TOTAL ELEC CUSTOMERS	50%
TOTAL KWH SALES	120%
RESIDENTIAL KWH SALES	206%
INDUSTRIAL KWH SALES	96%

POPULATION	13%
TOTAL ELEC. CUSTOMERS	22%
TOTAL KWH SALES	71%
RESIDENTIAL KWH SALES	155%
INDUSTRIAL KWH SALES	43%

POPULATION	38%
TOTAL ELEC. CUSTOMERS	55%
TOTAL KWH SALES	183%
RESIDENTIAL KWH SALES	222%
INDUSTRIAL KWH SALES	204%

POPULATION	29%
TOTAL ELEC. CUSTOMERS	62%
TOTAL KWH SALES	150%
RESIDENTIAL KWH SALES	292%
INDUSTRIAL KWH SALES	94%

POPULATION	16%
TOTAL ELEC. CUSTOMERS	57%
TOTAL KWH SALES	221%
RESIDENTIAL KWH SALES	340%
INDUSTRIAL KWH SALES	195%

TOTAL U. S. GROWTH

POPULATION	19%
TOTAL ELEC. CUSTOMERS	38%
TOTAL KWH SALES	136%
RESIDENTIAL KWH SALES	212%
INDUSTRIAL KWH SALES	122%

POPULATION	7%
TOTAL ELEC. CUSTOMERS	56%
TOTAL KWH SALES	313%
RESIDENTIAL KWH SALES	318%
INDUSTRIAL KWH SALES	349%

East South Central Region Leads Kwh Growth Race

REGIONAL electric utility industry growth in the last decade has differed substantially from the notable westward shift in population growth.

The most rapidly growing regions, Mountain and Pacific, have experienced 38-percent and 30-percent population increases compared with a 19-percent national increase during the 1948-1958 ten-year period.

The East South Central Region, while ranking last in population growth with a 7-percent increase, has experienced the most rapid kwh sales growth of any region in the last ten years. East South Central's 313-percent increase in total kwh sales compares with a 136-percent increase for the total United States and a 120-percent increase in the Pacific region.

The East South Central Region comprises the states of Kentucky, Tennessee, Alabama and Mississippi. Phenomenal total kwh sales increases in these states are primarily attributed to the 349-percent increase in industrial sales in this area during the ten-year period. Investor-owned electric utilities in 1958 served only about one-fourth of the industrial load in the East South Central Region, according to EEI's Large Light and Power Use classification. Atomic energy use has contributed substantially to the growth in this region.

A recent Department of Commerce population report shows that from April 1950 to July 1958, the following five states have achieved largest population growth rates:

State	Population % increase
Nevada	70
Florida	63
Arizona	57
Delaware	40
California	35

Following data, showing the five states with greatest increases in total electric customers during the 1948-1958 interval, indicate that even the increase in electric customers is not directly correlated with population increases noted above:

State	Total Electric Customer % increase
Florida	119
Nevada	96
New Mexico	91
Arizona	86
Georgia	66

States with largest increases in total kwh sales during the ten-year 1948-1958 interval include:

State	Total kwh sales % increase
Kentucky	771
Florida	325
Tennessee	308
Wyoming	287
New Mexico	284

The 1960 decade may experience similar startling trend shifts in the utility industry. Whether continued population movement westward will eventually play a greater role in future trends of the utility industry is an interesting point for consideration. Certainly increasing emphasis of area development and its effect on attracting new industry in all regions of the United States during the '60's is cause for interesting thought.

THE SOARING

Sales of electrical equipment should be 5 percent above 1959 . . . but shipments still exceed capacity of new orders

MANUFACTURERS LOOK FOR INCREASED ACTIVITY THIS YEAR

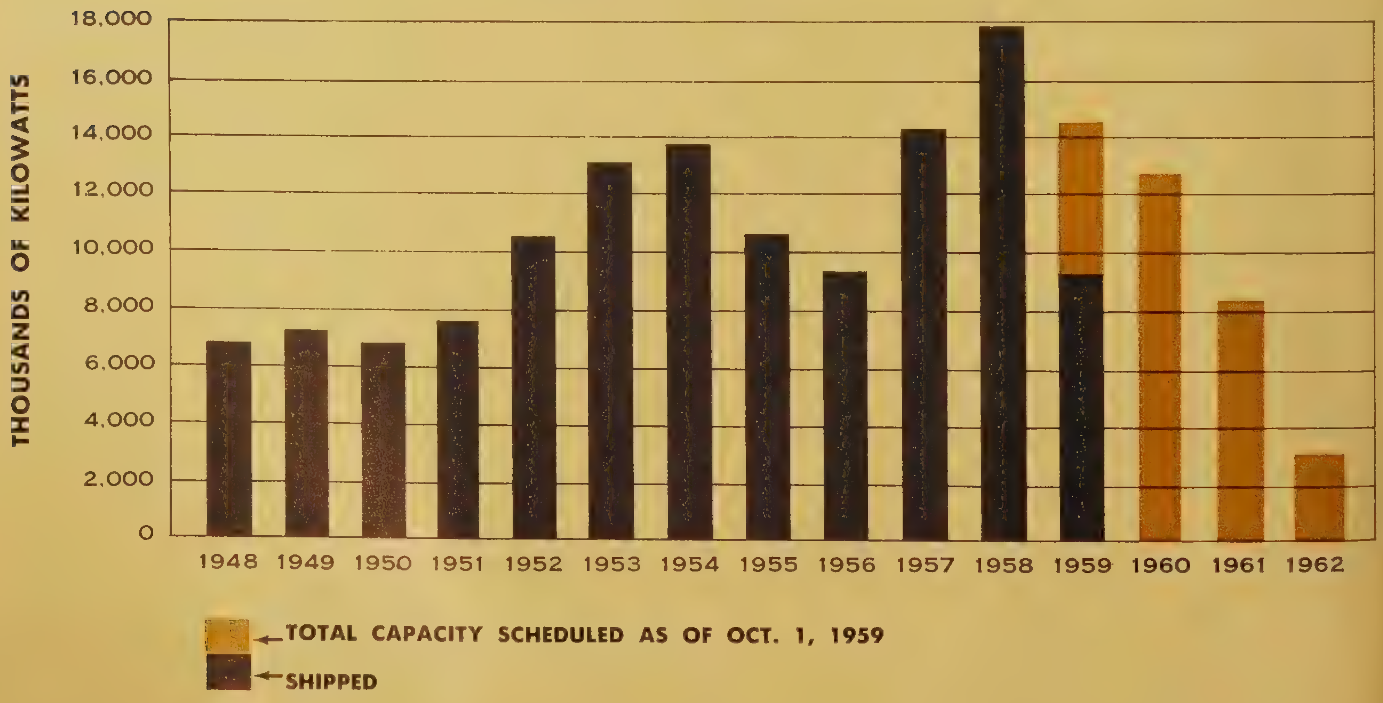
THERE is little indication that the United States will loose out to Russia in the kilowatt-race at any time in the near future, President King of EEI has declared. The importance of the statement is not that we will stay ahead of Russia in electric production *per se*, but rather, that through increased production of electric power our economic output—the total product of all work effort—shall be increased and the U. S. will remain ahead of its philosophical and economical rival—Russia.

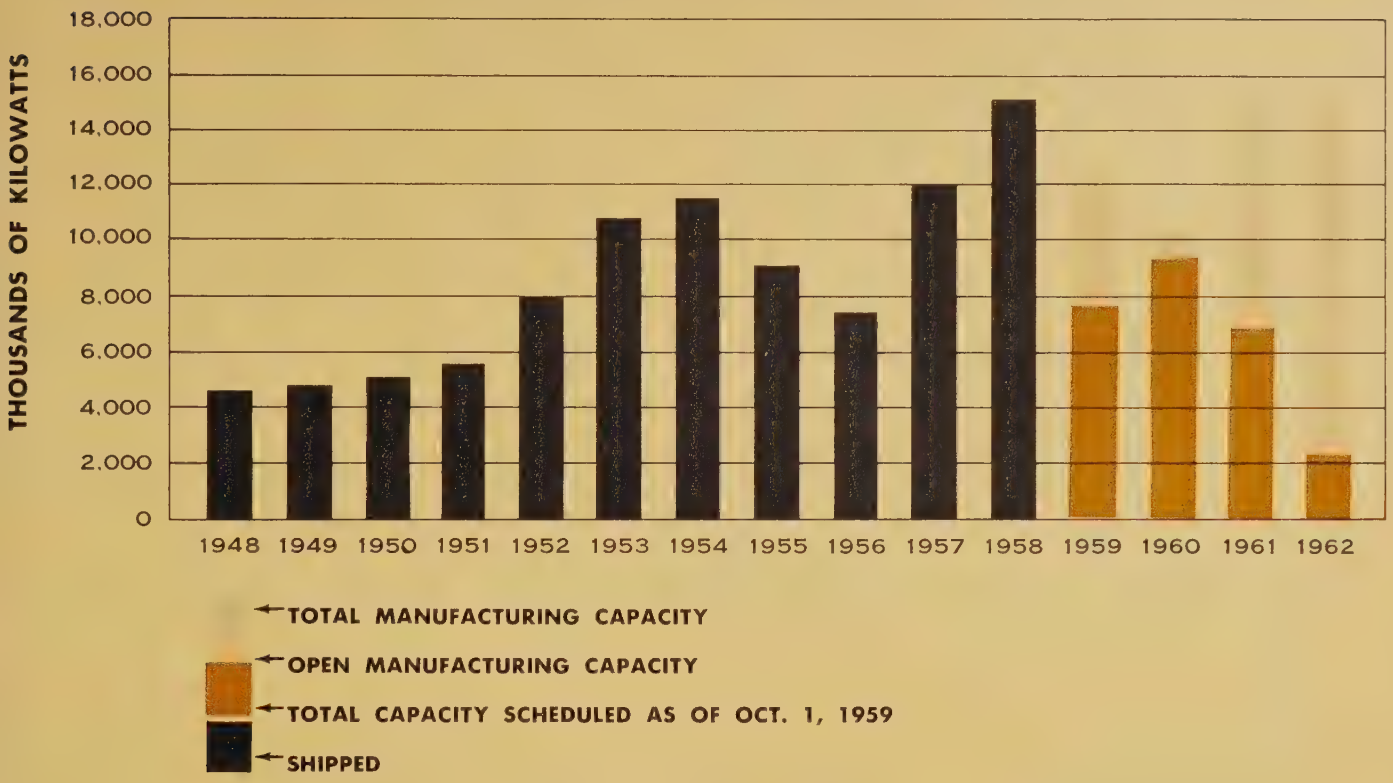
As N. J. MacDonald, president of NEMA has stressed, "Emphasis is rapidly shifting from man-hours to kilowatt-hours to meet the production requirements of our expanding economy.

"With about one out of every 20 non-agricultural workers employed by the electrical industry, it is reasonable to assume that America's standard of living today and in the coming years is dependent almost directly on the continued progress made in applying generous quantities of electricity to the tools and equipment used in every facet of our residential, commercial and industrial ways of life."

If the strength of the electric utility industry is not only indicative of, but largely responsible for, our economic power, it follows that detailed planning

Total Generating Capacity—4,000 Kw and Larger
Thermal and Hydro




Steam Turbine Generators—10,000 Kw And Larger

must be done now to prepare for the tremendous growth forecast for the decade.

Most of the new generation projects have been geared to the rate of growth experienced prior to 1957. As this rate was greater than actual growth after 1957, there has been a gradual but steady expansion of generating facilities to the point where gross margins now are about 27 percent.

According to EEI forecasts for the next three years, the combined regional peak loads show a relatively faster growth than the combined capabilities, so that by the end of 1962 gross-margin will drop to about 25 percent.

This prediction is borne out by the most recent survey of electrical equipment manufacturers, conducted by the EEI Power Survey Committee, which found the capacity of orders shipped continuing to exceed the amount of new capacity ordered.

Is the key manufacturing segment of the electrical industry ready to meet the new challenges of this tremendous growth prospect of the 1960s? The answer—resting largely on the impetus produced by the competitive efforts which are characteristic of the American economy—is an unqualified "yes"! Even the problems which develop from the traditional "cyclical" commitments of electric utility companies are not likely to catch U. S. manufacturers short, though their burden on supplier expansion planning is real and at times a severe one.

So, with as much courage as foresight, electrical equipment manufacturers continue planning for the "soaring 60s" in hopes that their utility customers will have a matching faith in this bright future.

Sales To Grow

What is the outlook of electrical equipment manufacturers for 1960? In general, excellent. All indications point to a five percent increase in sales, barring a major obstacle, such as another major strike.

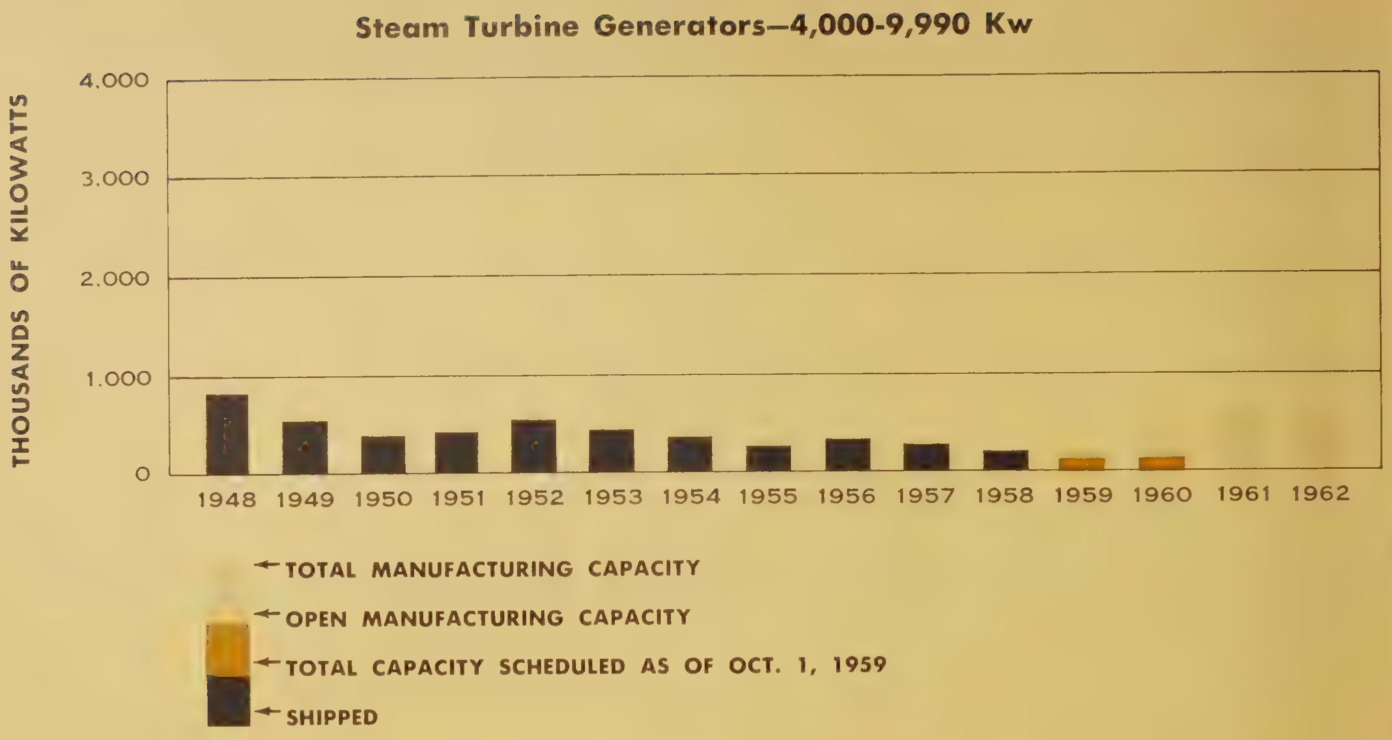
In 1959, total shipments of the 2500 manufacturers within the field amounted to $7.5-billion, an increase of more than $500-million over 1958. As far as the experts will say now, the prediction is that the growth of the electrical equipment industry in 1960 will exceed the national growth pattern, as indicated by Gross National Product. Although there is no established linear relationship between the two, population increases, new construction, the trend toward suburban living, and increased personal disposable income are direct factors influencing demand.

It is now felt that the construction industry will be down almost 10 percent in 1959 over 1958. This is despite a 23 percent increase in residential building.

A countering force is the continuing population growth and the speeded-up trend toward suburban living which have increased demands for electrical energy per home. The average home in 1959 used about 130 percent more electricity than did the average home in 1949. And there were some 20 percent more homes in 1959 than ten years ago.

The demand for electrical equipment is, of course, increasingly dependent upon the rapidly growing use of electrical energy by industry. Estimates place industrial use at 299-billion kwh, compared to 175-billion in 1949.

The final catalyst is the increased personal disposable income people now enjoy. This leads to modernization of existing dwellings, increased use of appliances and greater reliance of electricity.



New generating capacity installed by utilities in the U. S. last year amounted to 15.3-million kw. This new capacity alone creates a market for almost 95 million kva of transformers, $450-million of switchgear, and millions of dollars for pole-line hardware and other related construction materials.

Boiler Sales To Increase

In 1959, utilities who cut back expansion expenditures further during 1958's recession, reversed the downward trend of new orders which began in 1956. New orders for boilers were between four and five times greater in 1959 than in 1958, although only 21 percent higher than the average over the previous ten years.

The year 1960 should be one of the best years in recent history for new orders, but one of the lowest for shipments, reflecting the depressed market of 1957-58. New orders should run about 50 percent above 1959.

Shipments in 1960 may drop to the lowest point since 1955. Further, because of the lead time requirement and the major position of steel required to meet specific design conditions, the effect of the steel strike of mid-1959 may further reduce shipments in 1960. The subsequent raise in 1961 shipments would then be greater than currently anticipated.

Turbine-Generator Sales To Rise

According to manufacturers, shipments of turbine-generators in 1960 will reflect the depressed market suffered during 1957-59. While actual shipments will be low, current expectations are for 1960 to be a highly successful year for new orders. With total construction budgets set for an expenditure of almost $413-million for turbine generators alone, manufacturers are most optomistic.

T&D Market to Rise 3-percent

Manufacturers of transmission and distribution (transformers, switchgear, insulators, pole line hardware and related equipment), are looking for an increase in sales and shipments of about 3 percent in 1960. This would mean a total of some $965 million.

However, manufacturers are now faced with the lowest backlog of orders since 1950.

According to EEI, power transformers capacity scheduled for shipment in 1959 was about 95 percent of 1958 shipments but only 62 percent of the 1957 total. The total capacity now scheduled for 1960 and later amounts to less than half the capacity shipped in 1958. In addition, the capacity shipped exceeded the capacity of new orders by more than nine percent in 1959.

In the face of a cutback in additional planned electric generating capacity in 1960, transformer production, especially for distribution, is expected to continue its normal growth because of an expected two percent increase in the construction industry to a record $56 billion, despite a cutback in residential construction of from three to 10 percent.

Big Manufacturers Expect Gains

Westinghouse looks forward to 1960 becoming the peak year for electrical manufacturers. According to Mark W. Cresap, Jr., president, "New orders for all types of capital goods will be about 20 percent higher than 1959." He forecast an increase of 13 percent more new orders than in 1959 for the electric industry as a whole.

Ralph J. Cordirer, G-E president, also feels that 1960 will be an excellent year, with an upsurge in utility orders. He was quick to point out, however, that "deliveries on some of the equipment with long manufacturing cycles, such as turbine generators, will be down somewhat as a result of the low-level of orders received in 1958."

All in all, manufacturers are looking forward to an excellent year in 1960. Even with the tight money situation, only a few of the major utilities foresee any financing problem. That eliminates what is perhaps the major obstacle to utility expansion plans and opens the way for greater sales to this prime industrial market.

THE SOARING ELECTRIC UTILITIES BUDGET

Power system expansion in 1960 will need nearly $4.4-billion. Approximate expenditures include: Generation — 39 percent; Transmission—18 percent; Distribution—38 percent; and General Plant—five percent.

$4.4-BILLION FOR 1960 CONSTRUCTION

NEW CONSTRUCTION IN 1960 by our electric utilities will total approximately $4.4 billion. This is the over-all finding based on advance reports to EL&P from utilities serving over 76 percent of our nation's total customers and representing over 71 percent of the industry's total generating capability.

Although not a record figure, this budgeted total expenditure represents about 3.3 percent increase over 1959 expenditures for new construction. It also represents a construction program that will be the third largest in our industry's history.

Accompanying this report is a chart showing the construction budget allocations to the following:

A. Generation
B. Transmission Lines
C. Transmission Substations
D. Distribution Circuits
E. Rural Line Extensions
F. Distribution Substations
G. General Plant

Also accompanying this report are detailed tabulations showing the approximate breakdown of anticipated expenditures in all of the foregoing categories. The pattern for this breakdown has been developed through special studies conducted for EL&P by the consulting firms of Sargent & Lundy, Engineers, and the Middle West Service Company. This detailed data will be of invaluable aid to the electrical manufacturing industry in gearing its own operations in 1960 to best serve the needs of the electric utilities.

It will be noted from the chart and tabulations that approximately $1,716,000,000 is budgeted for construction of new generating facilities in 1960; $792,000,000 for new transmission facilities; $1,672,000,000 for new distribution facilities; and $220,000,000 for general plant.

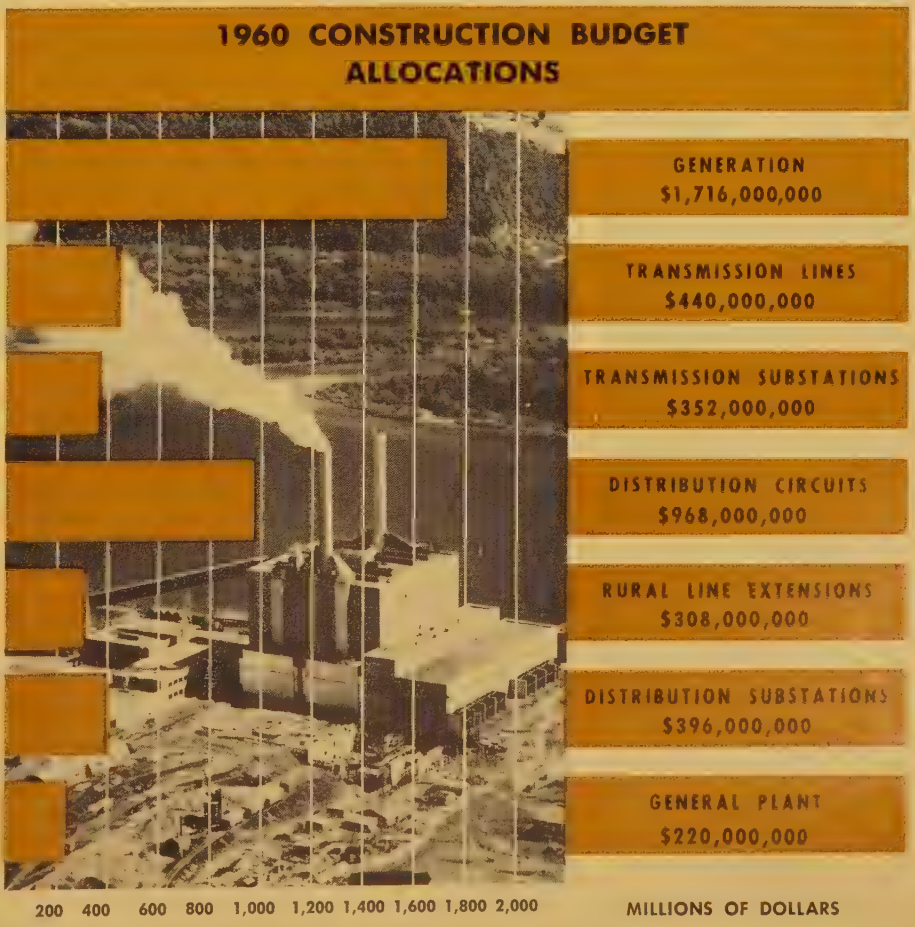


TABLE I

POWER GENERATION CONSTRUCTION

1960 Estimated Expenditures (Based on EL&P Survey Analysis)

A—Structures	Amount
Ground Improvements	$ 14,929,200
Main Building Substructures	44,616,000
Main Building Superstructures	68,811,600
Main Building Steel	60,060,000
Lighting	8,408,400
Miscellaneous Structures	4,461,600
Total Structures	$ 201,286,800
B—Boiler Plant	
Steam Boilers and Accessories	$ 340,111,200
Draft Systems	38,095,200
Feedwater Systems	66,237,600
Instruments and Meters	11,840,400
Boiler Plant Piping	121,492,800
Fuel and Ash Handling	37,752,000
Miscellaneous Steel and Iron	12,526,800
Total Boiler Plant	$ 628,056,000
C—Turbine Plant	
Turbine-Generators and Accessories	$ 412,869,600
Condensing and Cooling Equipment	66,580,800
Circulating Water System	58,515,600
Instruments and Meters	4,290,000
Total Turbine Plant	$ 542,256,000
D—Electrical Plant (Excluding Switchyard)	
Main Power Equipment	$ 36,894,000
Auxiliary Power Equipment	69,841,200
Misc. Equipment and Communication	1,029,600
Temporary Power and Light	4,804,800
Total Electrical Plant	$ 112,569,600
E—Miscellaneous Equipment (Cranes, Hoists, Air Compressors, Machine Shops, Fire Protection, Locker Rooms, etc.)	$ 15,958,800
F—Spare Parts	$ 6,864,000
G—Top Charges (Professional Services, Field Supervision, Temporary Construction Facilities, Miscellaneous Construction Expense)	$ 209,008,800
TOTAL GENERATION CONSTRUCTION	$1,716,000,000

Questioned as to the amount of new generating capacity they expected to *order* during 1960, the respondent utilities furnished total figures as follows:

During First Six Months	
Thermal	Hydro
3,044,000 kw	45,000 kw
During Last Six Months	
Thermal	Hydro
1,284,000 kw	83,000 kw
Grand Total	4,456,000 kw

Analysis of the returns also shows that only a very small percentage of the respondent utilities feel their expansion programs are handicapped by the increasing cost and difficulty of raising new capital. Comments such as these by the respondents are pertinent to this situation:

> "Continued inflation is certainly costly and harmful but we do not see that the industry can do anything but meet demands made upon it."
>
> "It is not handicapping the progress of construction but is burdening it."

Several Factors Delay Program

Many of the respondents noted the difficulties encountered in acquiring rights-of-way for transmission lines and sites for substations as severe handicaps in carrying out system-expansion plans. Further, this difficulty is growing in severity with each year of expansion of power systems.

Other major handicaps cited include failure of suppliers to meet equipment delivery promises, shortage of construction materials, and shortage of design engineers and draftsmen.

"Program Speeded Or Slowed?"

Some of the more important comments received in response to the question "Has your utility taken any deliberate action to speed up or slow down your construction program?" are noted in the following:

> "No action as such but we are examining authorizations more closely to see that they are not built in advance of needs. High cost of borrowing money prompted this action."

* * *

> "Construction program regulated to stay ahead of continuing load growth."

* * *

> "Delayed construction of a 150-mw unit from 1961 to 1962 as load growth did not require this unit in 1961 as originally planned."

"Have used outside firms to help with engineering design due to the shortage of trained personnel within company."

* * *

"Estimated expenditures for our construction program for the period 1959 to 1962 was increased from $560,000,000 to $625,000,000 due to extended hot spells this last summer."

* * *

"Certain items of 1959 construction program were deferred due to economic conditions in the company's service area."

* * *

"Construction retarded because of current unexpected reserve capacity."

* * *

"Some deferment of improvements not absolutely essential."

* * *

"Some overtime eliminated except when necessary to meet service dates."

* * *

"Initial operation of one generating unit re-scheduled from January 1961 to January 1962."

* * *

"Speeded up construction program to establish interconnection with another generating system."

* * *

"Accelerated construction because of rapid growth."

* * *

"Deferred construction of dam one year to conserve cash."

* * *

Composite Peak Still Rising

According to data furnished by the respondent utilities, the composite peak demand on their systems is still rising. Those respondent utilities which reached an all-time peak in 1959 reported percentage increases over 1958 ranging from a low of 102.4 percent to a high of 128 percent. Less than two percent of the respondent utilities failed to reach an all-time peak in 1959.

The over-all average for the 1959 peak demand of the respondent utilities was 109.8 percent of the 1958 composite peak demand.

For the respondent utilities, 34 percent experienced their 1959 all-time peak in the month of August; 47.7 percent in December.

TABLE II

TRANSMISSION SYSTEM CONSTRUCTION

1960 Estimated Expenditures (Based on EL&P Survey Analysis)

	Amount
Power Transformers	$ 63,360,000
Circuit Breakers	47,520,000
Switching Equipment (Including Disconnect and Air Breaker Switches)	15,840,000
Insulators	27,720,000
Connectors, Clamps, Splices, Armor Rods	11,880,000
Wire (Including Aerial Cable)	134,640,000
Cable (Including Potheads and Underground Cable)	15,840,000
Pole Structures (Including Hardware)	63,360,000
Tower Structures	23,760,000
Engineering	39,600,000
Other (Including Substation Structures)	7,920,000
Total Equipment	$451,440,000
Labor	340,560,000
TOTAL TRANSMISSION CONSTRUCTION	$792,000,000

TABLE III

DISTRIBUTION SYSTEM CONSTRUCTION

1960 Estimated Expenditures (Based on EL&P Survey Analysis)

	Amount
Poles	$ 83,600,000
Crossarms	23,408,000
Hardware (Includes hardware for guys)	56,848,000
Steel strand (Includes guys)	5,016,000
Overhead conductors	152,152,000
Connectors (As applied to conductors)	8,360,000
Cable	60,192,000
Insulators and insulator hardware	13,376,000
Switches, cutouts, fuses and arresters	50,160,000

Table III continued on next page

TABLE III (Continued)

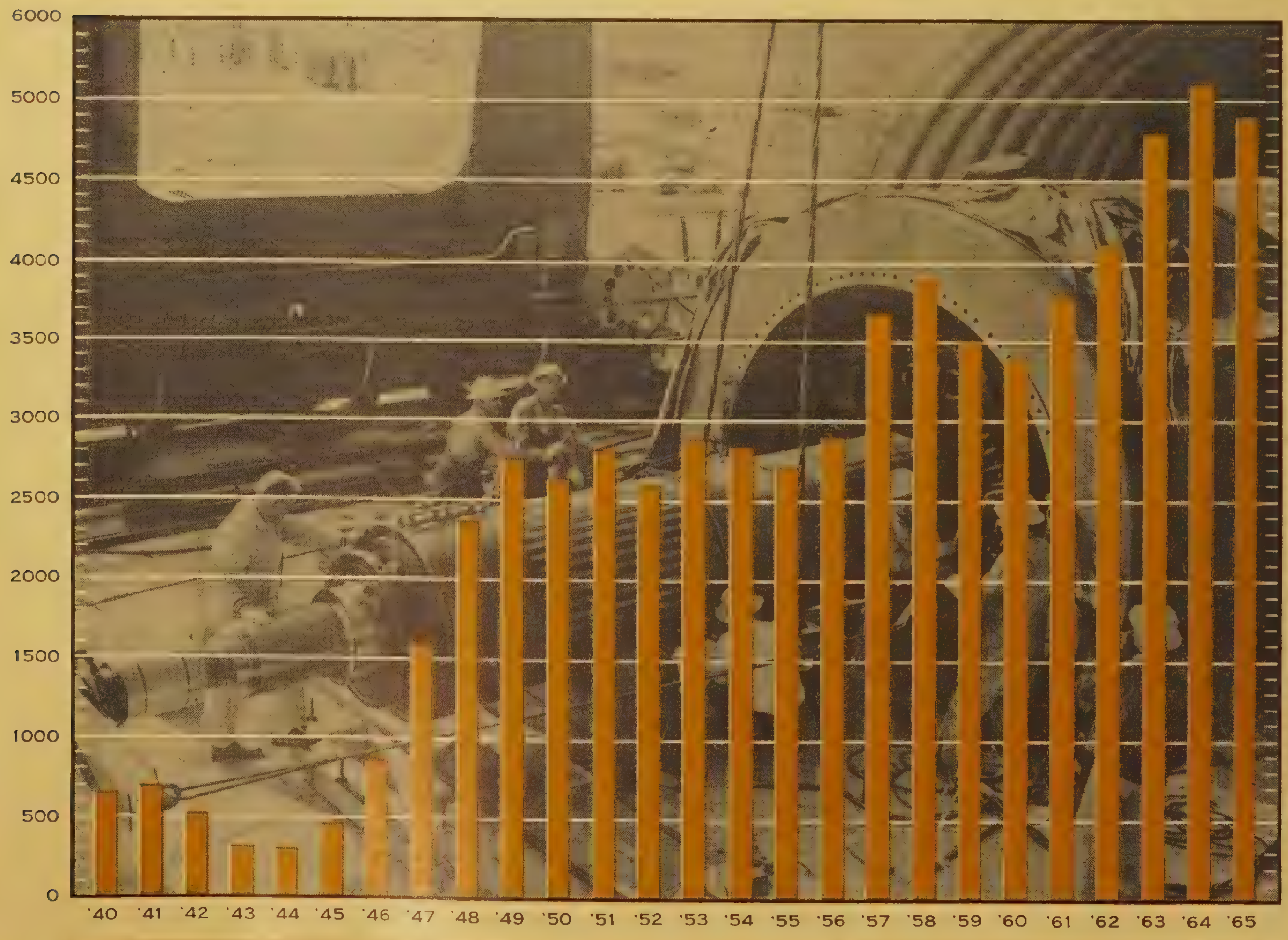
Circuit breakers	51,832,000
Regulators	18,392,000
Capacitors	20,064,000
Transformers	
Power Ratings (Above 500 kva)	75,240,000
Distribution Ratings (500 kva and below)	264,176,000
Meters and metering equipment	110,352,000
Street light fixtures and supports (Includes only street lighting facilities owned and operated by electric utilities)	10,032,000
Misc. station electrical equipment, buses and grounds	25,080,000
Underground ducts and manholes (installed)	55,176,000
Structures (installed)	36,784,000
Installation labor, equipment and overhead costs (Not included in "Underground ducts and manholes" and "Structures")	551,760,000
TOTAL DISTRIBUTION CONSTRUCTION	**$1,672,000,000**

Summary Comments

Our industry's $4.4 billion construction program for 1960 is a huge one and will contribute in large measure to a level of prosperity in 1960 that may exceed anything our nation has ever before experienced. If our nation's economy rebounds in 1960 as there is every reason to believe it will, demands for power may spurt upward at an even faster rate than is presently anticipated. Two important factors will strongly influence this boost in power demand. One is that increased use of electricity often outpaces general business recovery. The other is the tremendous impact of the industry's concerted, hard-hitting promotional effort, the effectiveness of which is far exceeding all previous efforts.

A note of thanks—

Our thanks and those of the entire industry are due the busy utility executive staffs throughout the nation who have given so generously of their time and effort in supplying the very comprehensive data that has made this report possible.



CONSTRUCTION EXPENDITURES

MILLIONS OF DOLLARS Investor-Owned Companies

Continued Growth Highlights Company Budgets

AMERICAN ELECTRIC POWER

Total company budget for construction in 1960 has been set for $112-million. Although somewhat less than 1959 construction expenditures, the figure marks the fifth consecutive year that the annual outlay has topped the $110-million level. Included in this amount are appropriations for AEP's subsidiary companies—Appalachian Power—$35.4-million, Indiana & Michigan Electric—$24.4-million, Kentucky Power — $2.7-million, Kingsport Utilities — $850,000, Ohio Power — $43.7-million, and Wheeling Electric — $1.9-million.

Largest expenditure will be $47-million for power plant construction. Also, planned expansion includes $40-million for distribution, and $15.4-million for transmission.

ARIZONA PUBLIC SERVICE

Plans to spend more than $19.5-million during the first six months of 1960 to provide new electric and gas facilities for Arizona were announced by John Jacobs, chairman of the board. In announcing the expenditure, Mr. Jacobs pointed out that the company has adopted a policy of updating construction plans every six months, instead of annually.

Largest single item during the first half budget for 1960 is the $4.7-million that will be spent for final construction on the company's Ocotillo Power Plant, now under construction near Tempe. New and improved facilities for transmitting power to distribution points throughout the state will account for $2.4-million through June, 1960, while electric distribution facilities will require $5.2-million.

BALTIMORE GAS AND ELECTRIC

Over half of the record $50-million one-year construction budget will be devoted to new generating capacity, including associated transmission facilities. The bulk of this will be for the Charles P. Crane Station, now under construction. Other expenditures are: expansion and improvement of T&D lines—$16-million; additions and improvements to gas distribution facilities—$8-million; general joint gas and electric improvement—$3-million.

During the five year period 1960-1964 inclusive, BG&E estimates it will spend more than $250-million.

BONNEVILLE POWER ADMINISTRATION

BPA plans a $21.4-million construction program for calendar year 1960, compared to $23.5-million for 1959, according to Assistant Administrator J. Lane Morthland. Contract construction work for the region is expected to show an increase of $1.6-million over 1959, with 1960 construction contracts totaling $5.2-million as compared to $3.6-million in 1959.

CENTRAL LOUISIANA ELECTRIC

Capital expenditures budgeted for 1960 continue to run directly parallel with anticipated net system electric generation requirements. For 1960 a 14-percent increase in requirements is anticipated, with a $14-million budget for construction. 1959 requirements were up 9-percent over 1958, and $9-million were spent for construction.

CLEVELAND ELECTRIC ILLUMINATING

Although 1960 is expected to be a year of good business levels, increased volumes and new peaks, the construction budget of $27-million will be the smallest in the past five years. However, $200-million has been budgeted for construction through 1964.

"Our budget will be smaller," said F. Warren Brooks, Vice-President-Finance, "because we have just completed two major construction projects. A $29-million addition to our Ashtabula Plant was completed a year ago. A $39-million addition at our Avon Plant was completed last month (December, 1959).

COMMONWEALTH EDISON

Commonwealth Edison has announced the largest four-year construction program in its history. Willis Gale, Edison chairman, said the board of directors had approved a $700-million construction expenditure program for the years 1960 through 1963. The program calls for expenditures of $160-million in 1961; $175-million in 1962 and $200-million in 1963.

The major items in the program are five generating station projects aggregating 1,595-mw of new capacity.

EL&P Survey: Highlights of Growth in '60

- **Total Spending: Up 3.3%**
- **Only 7% See Financing Problems**
- **No. 1 Delay Factor: Rights-of-Way**
- **Residential Sales: 188-Billion Kwh**
- **Industrial Sales: 323-Billion Kwh**
- **Commercial Sales: 121-Billion Kwh**
- **Kwh/Dollar GNP Is Now 1.68 (in 1958 dollars)**
- **Cost of Residential and Rural Electricity is now only 1.38% of Disposable Personal Income**

CONNECTICUT LIGHT & POWER

The Connecticut Light and Power Company continues its forward-looking program with plans to spend more than $32-million for new construction. Much of the 1960 construction budget is earmarked for a completely new electric power station at Norwalk scheduled to go into operation in the summer of 1960, when a new 150-mw unit will go onto the line.

CONSUMERS PUBLIC POWER DISTRICT

The board of directors has approved a 1960 budget which includes a record of about $22-million for construction and equipment. The total covers $14.7-million for the 100,000-kw Sheldon Station conventional steam power plant and the related nuclear power facility being built near Hallam. Wayne E. Barber, CPPD president pointed out that $3.7-million of the Hallam project money is being carried over from 1959 as part of the '60 budget. The balance will be devoted to transmission and distribution construction and equipment.

DAYTON POWER AND LIGHT

"We see no reason why 1960 should not be the best year ever", said James M. Stuart, president, in announcing a $17.3-million construction program for 1960.

The electric division program will total $11.5-million; gas, $5.6-million; and steam, $160,000. The 1960 program will not include any large projects, but rather the steady addition to the Company's growth and increased efficiency.

FLORIDA POWER

Continuing its multi-million dollar construction program, Florida Power will spend an estimated $32.5-million budgeted for 1960, according to President W. J. Clapp who sees, "a continued sound growth for Florida during the coming years, based on increased activity in industrial development, tourism, agriculture and the movement of permanent residents to the state."

GEORG [illegible]

The $54-million construction budget is one of the largest in its history. According to J. J. McDonough, president, "This budget is an indication of the company's confidence that the upward trend in business and industry in the state is expected to increase for several years." Sales should be up a billion kwh, commercial and industrial customers should increase by 2,400 (632-million kwh increase), and residential customers should grow by 18,000 (an increase of 240-million kwh).

GULF STATES UTILITIES

Gulf States Utilities Company, after investing $57.5-million in 1959, plans to budget $45-million in 1960, as part of its $200-million expansion program during the four-year period ending 1962. During this period 877,000-kw of generating capability will be placed in service, more than doubling the Company's capability over the year 1958. Three 111,000-kw units were placed in service in 1959 with 544,000-kw of additional capability to be completed by April, 1962.

HOUSTON LIGHT & POWER

$60-million for new construction has been programmed for 1960 and 1961 as part of a five-year expansion program being carried out during the period 1957-1961. Approximately $40 million will be spent this year and $20 million in 1961.

The program includes scheduled completion of two 220,000 kilowatt generating units this year, and of a 285,000 kilowatt unit in 1961; additions which will bring system capacity to slightly under three million kilowatts.

ILLINOIS POWER

Illinois Power Co. expects to invest $24-million in new facilities in 1960, Allen Van Wyck, president, announced. This figure might be increased by as much as $6-million for additional gas facilities if enough natural gas becomes available next year, he said.

The company plans to spend $12.3-million on electric facilities and $11.7-million on additional natural gas facilities next year.

INDIANAPOLIS POWER AND LIGHT

"The use of electricity in Indianapolis has more than doubled in the nine years since 1950, said O. T. Fitzwater, president, "and there is every indication that it will at least be doubled in the decade ahead." To prepare for this growth, the company has budgeted more than $45.3-million for construction over the next three years (1960 budget—$18.8-million).

About $20-million of the total will be spent for generation and $20.2 for transmission and distribution.

IOWA ELECTRIC LIGHT AND POWER

A record construction budget for 1960 with $16.2-million scheduled for construction and property additions, has been planned. This compares with a $13.3-million budget for 1959 and a budget of $8-million for 1958.

The largest item in the budget is an allocation of more than $7.7-million for construction work on a new 82.5-mw unit under construction at the Sutherland Station in Marshalltown. The transmission and distribution systems will be expanded in the amount of $5.2-million, while the gas distribution system has been allocated almost $2.4-million.

KANSAS GAS AND ELECTRIC

Although not specifying a 1960 budget figure, KG&E will spend over $61-million for new facilities by the end of 1963, including $18.5-million for the first unit at a power plant now under construction.

MINNESOTA POWER & LIGHT

Construction in 1960 will be at a low level following completion of the new Clay Boswell Steam Electric Station of 140,000-kw capability. About $400,000 will go to complete the plant, and something over $2.5-million will be used for normal system development.

NEW ENGLAND ELECTRIC

Total funds budgeted for construction in 1960 amount to $35-million. A large portion of this will go for beginning construction of a two-unit, 450-mw generating station at Brayton Point, due to go on the lines in 1963 and 1964.

OTTER TAIL POWER

Otter Tail Power will spend nearly $4.5-million on construction in 1960, according to C. G. Wright, company president. The 1960 construction costs will be about $4.7-million less than 1959 costs, primarily because a large new steam generating plant was completed in 1959.

The largest item in the 1960 construction budget is more than $2.2-million for transmission lines and substations. Of this amount nearly $1.3-million will be spent to initiate, continue and complete 115-kv transmission line projects.

PACIFIC GAS AND ELECTRIC

With a record increase of 1,300,000 new customers during the last ten years, PG&E will expend $152-million in 1960 to provide additional facilities to serve Northern and Central California. In announcing this program, Norman R. Sutherland, president, stated that the company's investments for construction in the decade total almost $1.7-billion and the aggregate since World War II is almost $2.2-billion.

The year-end total of 3,560,000 customers is almost 60 percent more than PG&E served ten years ago.

PACIFIC POWER & LIGHT

Construction expenditures totaling $33.7-million are budgeted for power production, transmission, distribution and planning during 1960 including a record one-year outlay of $14.1-million for improvements and expansion of distribution facilities in customer service areas in Washington, Oregon, Idaho, Montana and Wyoming.

Power production work is centered at the Dave Johnston steam-electric plant near Glenrock, Wyoming, where PP&L is adding a second 100,000-kw unit scheduled to go into service in October, 1960. Budgeted for completion of the project is $10.4-million.

PENNSYLVANIA POWER & LIGHT

P P & L estimates an expenditure of about $35-million for new construction in 1960 to meet the growing needs of its electric customers. Of this, approximately $14-million will be spent for new generating capacity and $21-million for transmission, distribution and other facilities. During the five-year period, 1960 to 1964, the Company estimates that the expanding demands of its customers will require expenditures of approximately $160-million. "As this steady pace indicates, we see ahead more of the continuing growth that has been characteristic of Central Eastern Pennsylvania throughout the postwar period," said Mr. Chas. E. Oakes, PP&L chairman.

PHILADELPHIA ELECTRIC

In 1960, expenditures for new and expanded facilities are set at $88-million. According to R. G. Rincliffe, president, outlays of $319-million are planned for the 4-year period, 1960-1963.

PORTLAND GENERAL ELECTRIC

In order to meet demands of a year which saw PGE surpass 250,000 customers, the utility expended nearly $13-million in general line and distribution construction in 1959. The 1960 construction budget, for the same purposes, is expected to run $11.6-million.

Not included in the 1960 figures, however, are any monies which might be spent should PGE get early approval from the Federal Power Commission on the proposed $71-million Round Butte dam on the Deschutes river.

Board chairman Thomas W. Delzell said "construction of Round Butte will start as soon after licensing as detailed plans can be prepared and job contracts awarded."

POTOMAC ELECTRIC POWER

R. Roy Dunn, president, says the company will spend $37-million in 1960 in its continuing program of expansion. Over the last ten years, PEPCO has spent nearly $300-million for new construction.

PUBLIC SERVICE COMPANY OF COLORADO

Nearly $32-million for construction of new facilities in 1960 has been authorized by the Board of Directors. R. T. Person, president, stated, "Board approval of the 1960 construction program when combined with previous authorizations brings the company's unexpended construction budget as of January 1, 1960, to more than $54-million."

Expansion of the company's electrical facilities under the 1960 program will require $21.7-million, of which $9.7-million will be used for electric distribution, $5.2-million for transmission, and $6.8-million for additions to the company's electric generating stations.

Mr. Person further said, "This approval does not include the 1960 construction plans of subsidiary companies which require authorization of their respective boards."

SACRAMENTO MUNICIPAL UTILITY DISTRICT

According to Royal Miller, president of the board, the 1960 budget is composed of the following items: about $800,000 for completion of the new office building; $13.1-million for additions and betterments to the electric system in the service territory; and $24.3-million for continued construction of the Upper American River Project—a total of $38.2-million. This construction budget is some $29.1-million greater than the entire budget for 1950.

The District will expend in 1960 about $3.7-million for construction of transmission substations and lines and $8.8-million for the expansion of the distribution system, including the provision of service to new customers. In addition, about $600,000 will be spent for general equipment, and buildings other than the new office building.

TEXAS ELECTRIC SERVICE

The 1960 budget is $10-million greater than last year's," J. B. Thomas, president and general manager said in announcing the record $35-million program. "Since 1947 the company has spent more than $200-million on additions and improvements to its system. Generating capability has been increased since 1947 from 120,000-kw to 1,140,000-kw and another steam-electric generating station under construction will be completed by the end of the year to add 240,000-kw to the system capability. The growth of our system is a further indication of the rapidly expanding economy of the area we serve and the 1960 budget reflects the confidence of the company and private investors in area's prospects for long-range population and industrial growth."

UNITED ILLUMINATING

With plans to spend $22-million for new construction in 1960, twice that of the previous year, United Illuminating Co. is in the middle of a three-year expansion program that will total $50,000,000 at the end of 1961. Approximately $13,000,000 of the 1960 budget is earmarked for construction of a 160,000-kilowatt unit at Bridgeport Harbor Station, scheduled to go into operation next year.

WASHINGTON WATER POWER

Washington Water Power, with its 400,000-kw Noxon Rapids dam near completion, will spend approximately $10-million for new construction in 1960. About $2-million will be used to complete the $87-million Noxon project.

$1.5-million will be spent on new transmission facilities including a line connecting the WWP and Idaho Power Company systems. New distribution facilities will require an expenditure of $3.5-million. Included in distribution expenditures is $352,000 for construction of a line from Grangeville, Idaho, to Elk City, Idaho. The Elk City area is one of the few places in the Northwest without electric service. WWP offered to provide the area with electricity after the REA in the area declined to do so.

UTAH POWER & LIGHT

UP&L and subsidiaries, The Western Colorado Power Company and Telluride Power Company, plan to spend $17.3 million in 1960 compared to a total expenditure of $14.3 million in 1959. Included is money for the completion in 1960 of a 65-mile section of 230 kv line from Nephi to Sigurd, Utah, the first link of a transmission line to extend from Salt Lake City, Utah. to the Utah-Arizona border and will connect Utah Power & Light Company and the Arizona Public Service Company systems.

REPRINTS OF THIS FORECAST AVAILABLE

So many persons who have contributed information for the development of this forecast have requested reprints that we are making them available to all readers of ELECTRIC LIGHT and POWER.

This information should be a helpful guide and yardstick for electric utilities, manufacturers and others serving the electric light and power industry.

Orders received prior to March 31 can be shipped upon receipt of the order.

Please fill in the order blank below. Quantity prices are listed.

TO:

ELECTRIC LIGHT and POWER
6 North Michigan Avenue
Chicago 2, Illinois
ATT'N: Reader Service Dept.

Reprint Prices

1-10	**25¢ each**
11-100	**20¢ each**
101-up	**15¢ each**

Please send ______ reprints of EL&P's 1960 Construction Forecast.

NAME ____

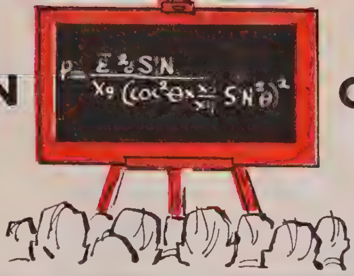
TITLE ____

ADDRESS ____

CITY ______________________ **ZONE** ______ **STATE** ______________

*** Please enclose payment for all orders of 10 copies or less.**

INDUSTRY IN CONFERENCE



Sangamo Workshop Seminar Emphasizes Measurement and Control of Power Capacitors

The second annual Workshop Seminar on measurement and control in the application of power capacitors, held recently in Greenville, S. C., featured outstanding guest speakers in the electric utility field. Electric utility transmission and distribution engineers engaged in power capacitor application attending the three-day seminar, met with Sangamo executives and the top design and sales engineers to discuss their capacitor problems and hear papers presented by the utility and Sangamo speakers.

Group discussions were moderated by Norman F. Rode, professor of Electrical Engineering at the Texas A & M College, and a well-known consultant in electrical transmission and distribution.

In discussing the "when, where and how much" of power capacitor application, Professor Rode said that they have become as necessary in electrical systems as transformers and no future system planning can be termed good without giving careful engineering consideration to how much ckva should be added and where, with each increase in load. Regular and proper instrument checking of distribution systems will have to follow to make sure that the actual conditions resulting on the system are following the engineering planning.

Reclaiming System Peaking

R. R. Wylie, Sangamo marketing manager and manager of Special Apparatus Sales, said that the most economical and rapid solution to many peak load problems is often the reclamation of system capacity through installation of static capacitors on the distribution system. In addition to lower investment, Wylie said that this solution has the following advantages over the installation of peaking generation: 1. Additional fuel cost at steam plants is substantially lower than operating cost of small peaking units. 2. Reduced losses in the subtransmission system and distribution transformers. 3. Lower maintenance costs. 4. Simpler and more compact installation. 5. No noise or fume problems.

System Measurement Important

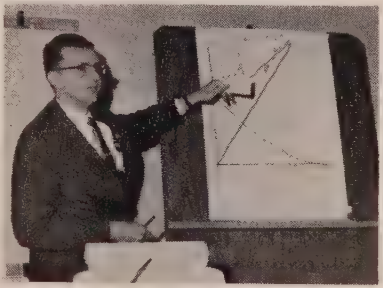
Glenn M. DeKraker, Sangamo assistant marketing manager, not only introduced the speakers throughout the seminar, but also presented a discussion on the importance of measured facts of power capacitor application. He said that in spite of the obvious value of system measurement, a majority of electric utilities do not have adequate instrumentation to efficiently operate. A frequently encountered reason for inadequate system metering is that "we don't have the manpower or the engineering time to make use of the information." A little time spent today by a few skilled people in planning a system measurement program can save a great deal of time in the future for a great many skilled people, DeKraker declared.

Moderator Norman F. Rode, professor of electrical engineering at Texas A & M College and well-known consultant in electric transmission and distribution, moderated the panel and group discussions.

The installation of 122 "Var" indicating meters at distribution substations has enabled the Alabama Power Co. to get the most for its capacitor dollar, said P. C. O'Shee, superintendent of distribution. According to O'Shee, these instruments are power factor "Bird Dogs" which give maximum and minimum lead and/or lag for each month. The substation meter reader records the readings each month and resets the hands on the monthly trip to read the distribution substation kwh and kw meters. He records these readings on the same form on which he records his monthly kwh and kw meter readings, he said. With this instrument pointing out the substations having bad power factor conditions, you reduce the number of distribution substations and distribution feeders that you have to check with graphic meters, O'Shee declared.

Controls and Fusing

W. C. Downing, assistant chief engineer in charge of Lincoln meter and instrument transformer development at Sangamo, described and discussed applications. He said that the many new variations of standard instruments that are continually being brought up is a healthy indication that both the utilities and the manufacturers are striving for better instrumentation and control of capacitor switching.



Economics of secondary capacitors are explored by Harry Saddock technical engineer, Rochester Gas & Electric Corp.

The group fusing of pole-type capacitor banks was discussed by W. J. Thacker, sales manager of Sangamo's Power Capacitors and Controls. Service records have proved the dependability of group fusing at a minimum of 165 percent line current, he said. Tank rupture has not been a problem under the more conservative limitation of bank kvar rating.

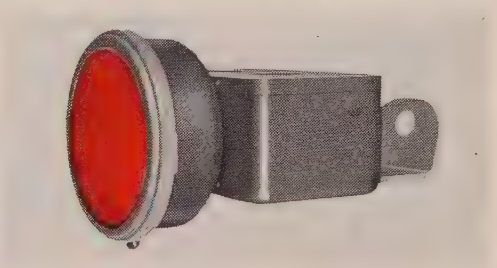
Design Advancements

In discussing the advancements in power capacitor design, J. F. Kuzela, executive engineer of Sangamo's Power

125L

The indicator is calibrated and set at the factory to operate on 60-cycle systems at the center of its range. The indicator can be reset, however, to suit conditions which past practice demonstrates to be unusual.

NEW WESTINGHOUSE TL INDICATOR TELLS WHEN DISTRIBUTION TRANSFORMERS SHOULD BE CHANGED OUT



The TL indicator responds to transformer load in much the same fashion as a conventional demand meter and with approximately the same sensitivity. Economically significant load peaks cause it to respond, but short load "spikes" leave it unaffected. The signal light operates at a predetermined load level which can be field adjusted.

Now You Can Determine Economic Transformer Load Limits Across Your Entire System . . . Economically, Accurately and Rapidly

Proper loading of distribution transformers has long been a major utility operating problem. Underloading results in unnecessarily high capital investment, while overloading yields high operating costs and poor voltage regulation. The Type TL Load Indicator, developed by Westinghouse, now effectively opens a tremendous new area for operating cost reduction and the lessening of revenue losses.

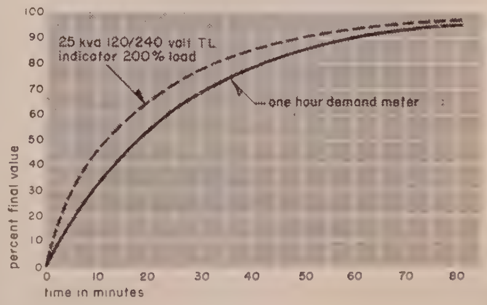
How Does This New Development Affect Load Management? Existing methods of system load measurement have been able to substantially protect you from transformer burn-outs. On the other hand, load checks based on incomplete load data or other types of indicators that require shop installation have not permitted accurate or rapid enough determination of the point at which you are no longer benefiting economically from the extra capacity which we build into our transformers. In fact, it is quite possible that you are operating in the area of loss loading long before the condition is recognized.

With the TL, it is now possible to economically, accurately and rapidly determine economic load limits across your entire system, and to determine whether the existing transformer should be replaced by a larger kva rating or an additional transformer.

Is the TL Adaptable for Your System and Equipment? The Type TL indicator is designed for economical, flexible application to either new or existing transformer installations. The TL can be mounted directly on the low-voltage neutral grounding pad provided on all distribution transformers built in the last 25 years. To install, it is only necessary that the two line leads of the low-voltage secondary pass through the openings in the back of the indicator case.

Your Westinghouse representative will be glad to demonstrate and discuss the new TL indicator with you. Or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

J 70936



The TL indicator is adjusted for a demand interval of about one hour. This means that if a steady state load is applied, the contact arm will deflect so that it reaches 90% of full value in one hour. If the load is continued, full deflection is reached in about two hours.

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV ALTERNATE FRIDAYS

Capacitor Division, said that for continuous operation, the kvar loading of capacitors should not exceed 135 percent of their kvar ratings. As a rule of thumb, the life of capacitor varies as the fifth power of the voltage. And the life is halved for every 10 C rise in ambient temperature. Test conditions must be tempered to reasonable values so as not to destroy the capacitor inadvertently, Kuzela said. And test voltage under these conditions should not exceed $1\frac{1}{2}$ times the rated voltage of the capacitor, nor should the ambient temperature at which the capacitor is tested exceed 65 C.

Locating Capacitors

Novel numerical techniques for locating shunt capacitors were described by L. John Rankine, public utility industry marketing representative, International Business Machines Corp. These techniques make it possible from simple source data to arrive at the following decisions by digital computer solution, thus obviating tedious manual computations, he said. 1. Total amount of ckvar to be applied to the feeder. 2. That portion of the ckvar which should be installed as fixed shunt capacity and that which should be fixed. 3. Optimum sizes for both switched and unswitched capacitor banks. 4. Optimum locations for each bank so as to obtain a beneficial return in reduced system losses, improved feeder voltage and released system capacity. 5. Estimated cost of total shunt capacity to be installed on each feeder.

Voltage Regulation

Voltage regulation with switched capacitors was demonstrated graphically by Wendell C. Fowler, assistant to Sangamo's vice president—Manager Power Equipment. He said that some large utility systems are using regulators only for variations in transmission voltage, utilizing the action of capacitors to compensate for line drop. Where subtransmission is involved, this introduces a considerable value of inductive reactance in the circuit ahead of the capacitors which adds greatly to their performance in this respect, Fowler stated.

Applications for series secondary capacitors are explored by Frederick Crowell, load and voltage supervisor, Public Service of Oklahoma.

Primary Capacitors

From a test program of metering reactive load for a sample of distribution circuits on Consumers Power Company's system, rules were established for the amount of primary capacitors which could be installed on each circuit, said John R. Frey, distribution engineer, with this company. The established rule of thumb is to install kilovars of fixed capacitors up to one-sixth of the peak kva load and kvars of switched capacitors equal to an additional one-sixth of the peak kva load, Frey stated. New capacitor banks are located as far out as possible on the primary. The farther out they can be located the more voltage rise benefits can be obtained. However, banks of 300 kvar will undoubtedly cause a leading current if located where the load is small. Therefore, banks are installed only where the peak load is at least 400 kva, he said.

Workshop speakers group (l to r) W. C. Downing, assistant chief engineer—Lincoln meter and instrument transformer development at Sangamo; W. J. Thacker, sales manager of Sangamo's Power Capacitors & Controls; D. C. Blanchard, vice president and manager of Sangamo's Springfield plant; R. R. Wylie, Sangamo marketing manager and manager of Special Apparatus Sales; P. C. O'Shee, supt. of distribution, Alabama Power Co.; Glenn M. DeKraker, Sangamo assistant marketing manager; and Norman F. Rode, professor of electrical engineering, Texas A & M College.

Design Consideration

In discussing capacitor equipments design considerations, R. W. Tracey, Sangamo project engineer on development and application of power capacitor equipments, said that structural aluminum is the most popular metal in current use for factory-assembled racks. He said that the most widely used heat-treated aluminum alloy for this purpose is 6061-T6. It is best to avoid the use of dissimilar metals where practicable. Galvanic attack can be substantially minimized through the selection of the most compatible metals suitable for the job and by employing protective coating where necessary, Tracey declared. Wherever possible, rack equipment members should be welded, because it is both versatile and economical. It saves material and reduces the weight of many stressed assemblies.

Secondary Capacitor Economics

H. G. Saddock, technical engineer, Rochester Gas & Eelctric Corp., presented a study of the economics of secondary capacitors. As an answer to justified voltage complaints with uniform load, the secondary capacitor is at best a temporary expedient, because voltage gain is insufficient to correct complaints, Saddock said. It is a useful tool, however, in cases where a customer wishes to have something done more than voltage correction. The psychological impact of fast action combined with a small amount of voltage correction helps "hold the fort" while more permanent steps are being arranged, he said.

Series Capacitors

D. C. Keezer, electrical engineer, Pacific Gas & Electric Co., presented a summary of 11 years of operating experience with 12-kv line type series capacitors. He said that a series capacitor correctly applied can be a very effective and economical means of reducing voltage fluctuations and increasing cir-

(Continued on page 123)

G-E Previews Residential Loadbuilding Plans For Utility Sales Executives

Residential market-development plans and prospects for 1960 were given intensive analysis during a two-day Utility Sales Executive Conference conducted by General Electric at Appliance Park in Louisville, Ky., during December.

Although primary attention was centered on G-E's new total-electric Gold Medallion Home program, much of the program was devoted to such related subjects as electric heating, lighting, air conditioning, dealer development and training, and product servicing.

Conference chairman throughout the sessions was C. W. Theleen, customer relations manager for GE's Major Appliance Division. The company's new Gold Medallion Home program was presented by George Bogard, acting manager of the residential market development operation, who emphasized that every possible avenue will be used to make the Gold Medallion Home the new "Status Symbol of America." The largest share of the company's multimillion dollar program will be spent at the point-of-sale. Participation by the electric utilities at the local level is essential to success of the program, Mr. Bogard stressed.

An enthusiastic reaction to the new program was voiced by L. M. Alexander, assistant general manager of the Salt River Power District. He termed the G-E program "a dramatic and stimulating new approach to the job that dedicated electric utilities have already undertaken . . . put the American public in safe, clean, quiet, efficient and year-round comfortable total-electric homes."

Mr. Alexander documented western progress in this field and declared that "in the West our problems are not insurmountable and our growth and market potentials are exceedingly large."

Speaking for the middle west, Thomas J. Ayers, vice-president, Commonwealth Edison Co., complimented G-E for their astuteness in applying promotional pressure in those utility markets offering the greatest opportunity and cooperation. He said that, in 1960, "we will be out to sell every Gold Medallion Home we can — wherever we can — houses, flats, apartments, motels—new ones, rebuilt ones, and more and more conversion jobs."

Thomas J. Ayers, vice-president, Commonwealth Edison Co., addressing Utility Sales Executive Conference at Appliance Park.

Conferring between sessions at the G-E Utility Sales Executive Conference are, l to r: Ross R. Cahal, Jr., senior marketing consultant, Ebasco Services Inc.; C. W. Theleen, manager of Customer Relations for GE's Major Appliance Div.; Carl Richey, assistant general manager, Sacramento (Calif.) Municipal Utility District; and Herbert Heinrich, commercial manager, Hawaiian Electric Co.

Participants in GE's Utility Sales Executive Conference, l to r: George Bogard, acting manager, Residential Market Development Operation, Major Appliance Div., General Electric Co.; L. M. Alexander, assistant general manager, Salt River Power District; W. P. Von Behren, general manager, Major Appliance Division, G-E; and Fisher Black, vice-president, Tampa Electric Co.

Mr. Ayer's optimism as to the success of the G-E program in the middle west was based on Commonwealth Edison's success in selling electric heating—from 140 electric-heat jobs in their service area at the end of 1957 to more than 4000 today. He observed that "we have at least twice as many degree-days as the South—50 percent more than the West. We have the highest building costs in the nation. If we can sell electric heat here, you can sell it anywhere. Notice I said sell it."

Other utility executives who commented on the Gold Medallion Home program were Dale Washburn, vice-president, Boston Edison Co., and Fisher Black, vice-president, Tampa Electric Co.

W. P. Von Behren, general manager of G-E's Major Appliance Division,

(Continued on page 120)

Cordiner Condemns Unfair Business Practices

"Complacent and uncompetitive businesses lose money . . . and sound business judgment argues against actions that restrict competition . . ."

This is so, even if it were not a matter of law and business ethics, GE's Chairman Cordiner reminded the company's management conference on January 5. But, because such actions *are*, inescapably, matters of law and ethics, the message he delivered to the managers of the organization that is "first in public favor among all industrial companies" was to echo and re-echo across the business community.

For, General Electric top management had decided to put its own spotlight on the discrepancy between longstanding written policy and the actions of certain responsible company employees. The policy—of "competing aggressively and avoiding any price discussions with competitors"—had been violated.

How many key men at GE were implicated in these unauthorized managerial practices was not known even to Mr. Cordiner, he noted, since the company's own investigations were continuing. It was obviously GE's hope to identify its own offenders.

As for penalties, GE acted quickly and firmly, too, while indicating that even more severe penalty might await "some of our associates who may be found personally and individually liable under criminal indictments which may be returned by the Grand Jury."

It seemed sure that GE operations were affected in a substantial way, since, even where offenders had been identified, penalties in some instances were to await "restaffing consistent with maintaining service to customers and protecting the jobs of innocent employees," according to Mr. Cordiner. He added: "We must keep these particular businesses running, for the sake of the customers, share owners, employees and communities involved."

Individuals of varying responsibility have been implicated in varying degrees, Mr. Cordiner disclosed, and the action taken was based in part on the degree of responsibility involved, the most serious discipline being imposed on those of higher authority.

"Surely the company could not continue individuals in positions of responsibility where the facts showed not only an intentional violation of the company's policy, but where the individuals involved in some cases initially misrepresented the facts to their superiors.

"The persons responsible for these violations of company policy must be disciplined by such penalties as resignations from their officership, removal from their present assignments, demotion in rank, decrease in pay, and assignment to positions where the offenders can have no authority or responsibility for pricing. These penalties are being imposed as rapidly as the cases of violation can be fairly reviewed," said Mr. Cordiner.

The GE head then offered this caution: It would be most unfair to speculate as to whether any particular change in assignments is related to this problem, since the company is always making organizational changes, and the disciplinary action will involve only a very few individuals.

Here is the way GE top management (in the words of Mr. Cordiner) described the unravelling of the story of business practice beyond its own ken:

"In June of this year a Grand Jury had been convened in Philadelphia to investigate pricing policies of the electrical manufacturers, principally pertaining to published quotations which had been submitted in recent years to government agencies such as TVA. I discussed that subject with a number of members of the executive office and we jointly concluded that, from any information we then knew, General Electric would not be involved in any irregularities or collusion with competitors in pricing.

"Three months later—approximately the middle of October—from sources outside the General Electric Company, we received information that certain individuals appearing before the Grand Jury in Philadelphia had testified that there had been price discussion between competitors in the electrical manufacturing industry with respect to the products of some General Electric Operating Components, and that certain General Managers of these Operating Components had been mentioned by name as having participated in these discussions.

"When the issue was first raised by publicity in the newspapers, many of these same company associates had been interrogated by their superiors or by company counsel and had categorically denied any such acts. Later, when the outside information came to our attention, the matter was again discussed with the persons involved.

"This time, when confronted with the outside information, they acknowledged that during the past several years, and in some cases continuing in 1959, they had been a party to the discussion of prices with their competitors in violation of the company's Directive Policy 20.5. That they knew what they were doing was wrong was borne out by the fact that they concealed this activity from their lawyers, the executives, and anyone else not party to the activity."

In his message to the GE annual management conference, Mr. Cordiner elaborated further:

"This is an issue of a very few versus the many. In all areas of the world there are about 275,000 General Electric employees—including employees of wholly-owned affiliates—and as you are aware, over 400,000 share owners, some 50,000 suppliers and vendors who serve the company, and many hundreds of thousands of retailers, agents and distributors who sell and service the products of the ompany. All of us must conduct ourelves in the interest of these larger roups and the customers and the pubc. What has occurred is to be deeply egretted, and I fear its blot upon the ompany's good name will live with us or many years, because our detractors ill publicize it, repeat it, and attempt o have the public interpret it as typical f the acts of all General Electric peole. But this situation will pass, as have ther unfortunate situations. The pubc has faith in the General Electric ompany as a corporate entity. We ust measure up to that faith and onfidence.

“But even if this were not a matter f law and business ethics, sound busiess judgment would argue against ctions that restrict competition.

“In the past 13 years the board of irectors has authorized, based on your equests, the expenditure of some 1-billion, 648-million for facilities, quipment, and laboratories, to make eneral Electric Company the most odern innovator in the electrical manfacturing industry. If you considered his issue of compliance with the anti-rust laws on only the basis of busiess opportunities there is nothing, in y opinion, that is less intelligent than n attempt to have price restrictions ith your competitors who do not have hese modern facilities, or have this company's organization or public acceptance on which to sell company values to customers. Every company and every industry—yes, and every country—that is operated on a basis of cartel systems is liquidating its present strength and future opportunities.

“I want there to be no question that the General Electric Company, as stated in Policy 20.5, will have nothing to do with restrictive or collusive practices, or any other actions contrary to the anti-trust laws. Furthermore, there is to be no acceptance of the type of management that, while it may be within the bounds of legality, is complacent and uncompetitive in the business sense. Complacent and uncompetitive businesses lose money. This is a matter of common experience, and it should hardly be necessary for me to have to remind the organization of such fundamentals at this late date.”

Mr. Cordiner pointed out that General Electric could only expect business which it rightfully earned from customers because of the quality of its products and its technical skills. He emphasized that earnings should depend upon technical accomplishment and competent selling effort and that a business so conducted, with a proper regard for the type of business ethics which the public has a right to expect of it, was the only business certain to prosper.

> General Electric's written policy prohibiting any employee from discussing prices, terms and conditions of sales or other competitive matters with any representative of a competitor, has been in effect since 1946 and reissued to all managerial employees on a number of occasions in recent years. Almost unique in American industry, the policy specifically says:
>
> “It is the Policy of the Company to comply strictly in all respects with the anti-trust laws. There shall be no exception to this Policy nor shall it be compromised or qualified by anyone acting for or on behalf of the Company. No employee shall enter into any understanding, agreement, plan or scheme, expressed or implied, formal or informal, with any competitor, in regard to prices, terms or conditions of sale, production, distribution, territories or customers; nor exchange or discuss with a competitor prices, terms or conditions of sale or any other competitive information; nor engage in any other conduct which in the opinion of the Company's counsel violates any of the anti-trust laws.”

National Electrical Week Kicks Off Soaring 60's

“Electricity Sparks the ’60's,” the ew slogan officially recognized for he first time during NATIONAL LECTRICAL WEEK—February 7-13 -symbolizes the entire multi-billion ollar electrical industry, begins the ew decade with employment at a 3-illion-plus peak, prospects for another ood year in 1960, long-term optimism, nd drawing boards crammed with new roduct ideas to match the far-reaching eeds of what promises to be a “fabuus decade of opportunity and achieveent.”

A forecast of things to come in and om the electrical industry, has been ade by N. J. MacDonald, president of e Thomas & Betts Co. and chairman f the National Electrical Week obrvance. Here are some of the highghts of his predictions:

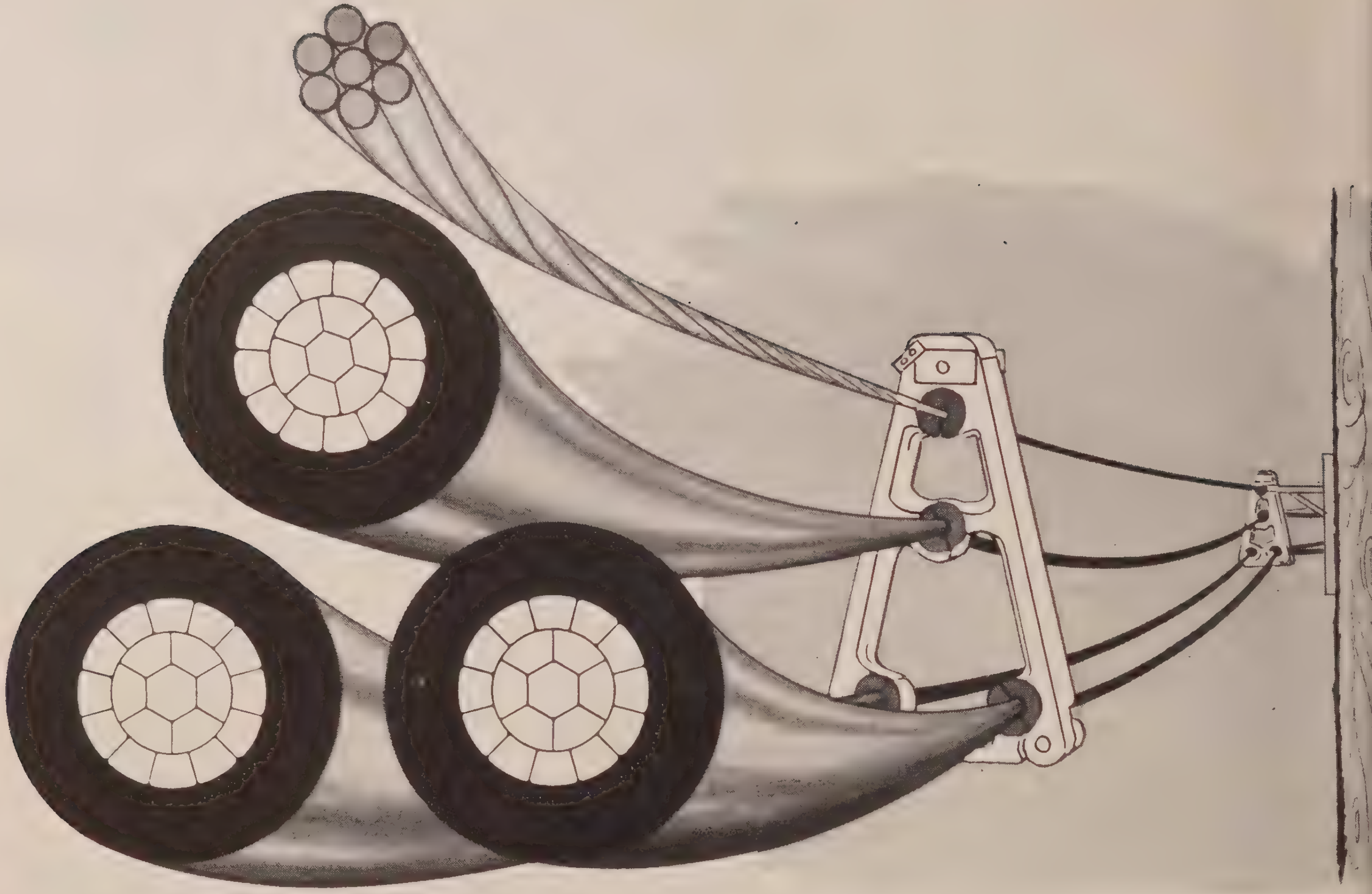
“Emphasis is rapidly shifting from man hours to kilowatt hours to meet the production requirements of our expanding economy. As a result total power generation by the utility industry could well approach the 1.5-trillion kilowatthour mark by 1969, compared with the present mark of around 700-billion kilowatthours.

“With about 1 out of every 20 non-agricultural workers employed by the electrical industry, it is reasonable to assume,” said Mr. MacDonald, “that America's standard of living today and in the coming years is dependent almost directly on the continued progress made in applying generous quantities of electricity to the tools and equipment used in every facet of our residential, commercial and industrial ways of life.

“In 1960 the value of electrical construction put into place in all types of new and modernized and repair buildings and facilities, covering the cost of electrical construction materials and labor and engineering involved, will exceed $10.2-billion, 12-percent of the anticipated $85-billion total outlay in 1960 for construction, the nation's largest single economic activity.

“The electrical industry expects that the continuing upward demand for an even higher standard of living at home, will result in a 70-percent increase in sales of major appliances in the next 10 years, an average per year sales increase of 7-percent. In addition, expectations for the next decade are that manufacturers will produce more than 175,000,000 appliances.

“This ‘electrifying view of the future’ gives added impetus and importance to 1960's observance of National Electrical Week.” Mr. MacDonald concludes.



ADVANTAGES OF COMPRESTO CABLE

COMPRESTO aerial cable is the lightest, most compact stranded conductor available today.

OPERATION through storms and ice conditions greatly improved.

MORE economical than fully insulated aerial cables.

PHASE identification is positive and simple.

REACTANCE is less, thus more improved voltage regulation.

EASY to install.

SAME ampere rating as with open wire construction.

TAPS and transformers may be added with little difficulty.

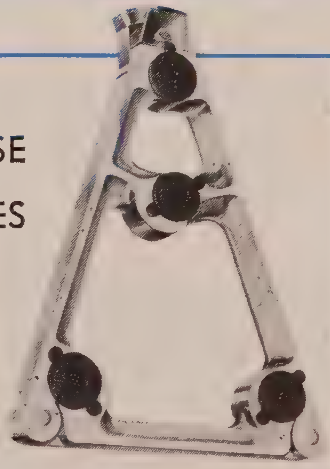
OFFERS improved resistance to compression cutting of the covering.

Write for brochure on Aerial Cables

Compresto® NOW AVAILABLE AS SPACED AERIAL CABLES

THE ULTIMATE IN A *COMPACT* SYSTEM CAN NOW BE ACHIEVED BY COMBINING Compresto® CABLES WITH **PLM's** NEW "WRAPAROUND" **5KV** SPACERS

FOR **15KV** SPACED AERIAL CABLE SYSTEMS USE **Southern Electrical's Compresto®** CABLES AND **PLM's** NEW HIGH **ALUMINA** "WRAPAROUND" "LIFETIME" SPACERS



Southern Electrical Company

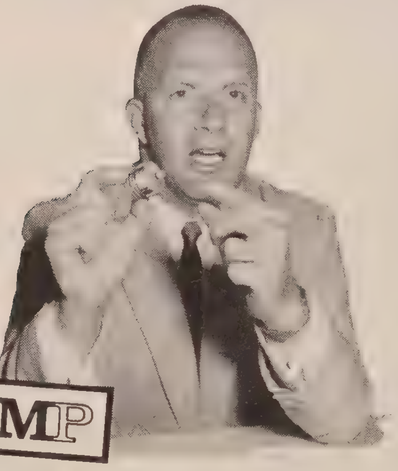
OLIN MATHIESON • METALS DIVISION • CHATTANOOGA, TENNESSEE

See Edward R. Murrow on "Small World" every Sunday evening, CBS-TV.

OLIN ALUMINUM

Join the Utilities Who Say—

"NO MORE FUSE SERVICE since MINNIE"



MP

MINI-BREAKER®

Ends Fuse Service FOREVER!

The Customer just presses the button to restore electrical service

You cut your service call expense immediately when Mini-Breakers take over for fuses. This Underwriter Laboratories, Inc. listed, screw-in circuit breaker ends once and for all time the service interruption, and the customer aggravation caused by blown fuses. It promotes electrical safety and customer good will. Mini-Breaker is one of the most important things to happen in power distribution management field in a decade. Write for full details on how its benefits can be brought to you as a forward thinking utility.

STOPPING THE FUSE SERVICE PROBLEM WITH MINI-BREAKER®

WRITE FOR BETTER MANAGEMENT FILE No. 1

C. E. White, Util. Sales Mgr.

MECHANICAL PRODUCTS, INC.
1824 River Street • Jackson, Michigan

Average Housepower Rewiring Cost $196 in 1958

The average cost for home modernization rewiring in 1958 was $196, according to a HOUSEPOWER survey just released by the Edison Electric Institute's Live Better Electrically Program. The modernization of wiring systems of existing homes covered 100 Amps or larger service entrances. Only 16,000 of these were financed, it was noted.

Over half the electric light and power companies covered in the survey promote local adequate wiring programs.

At least 114,000 rewiring jobs resulted from the HOUSEPOWER promotional program sponsored by the Institute, the trade association of investor-owned electric utilities in the country.

In addition, thirteen thousand electrical contractors participated in this HOUSEPOWER program.

Outdoor Electric Heating on Trial

Window Shoppers Gaze in Comfort

A Chicago department store, Carson, Pirie, Scott & Co., has put a new quartz infra-red heat lamp system into operation to warm passers-by and window shoppers in front of its State Street display windows.

It is the country's first permanent outdoor installation of quartz infra-red heat lamps designed to take the chill off winter shoppers.

Developed by the General Electric Company five years ago, the quartz infra-red lamps have many unique characteristics which have led to this and other uses. One is the manner in which they heat—warming exposed objects rather than the surrounding air. Most methods of heating first warm the surrounding air which in turn warms a person or object.

Since only persons or objects the lamps rays fall on are heated instead of the air, the wind will not affect the amount of heat received under the lamps, according to G-E engineers. However, it will cause the body to lose its heat faster and thus feel less heat sensation as the wind blows stronger. Even so, it will feel more comfortable under the lamps than elsewhere outside.

The lamps are also expected to warm the sidewalk in front of the store. As a result, the sidewalk will radiate some heat upward and will tend to keep the walk dry during inclement winter weather.

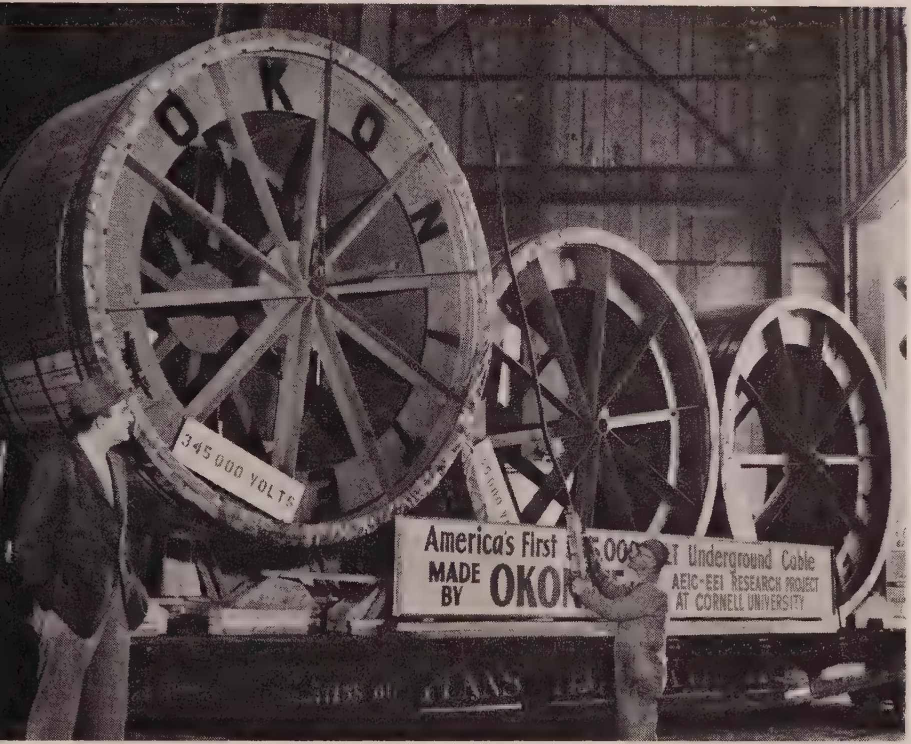
In addition, the quartz infra-red heat lamps actually will provide a "golden band of light" along the State Street sidewalks in front of Carson, Pirie, Scott and Company. The lamps give off "candlelight" tinted rays which are flattering to complexions. There'll be a light level of more than 500 footcandles in front of the windows . . . equivalent to about 15-times the lighting level in the average American house.

Each fixture is 16-feet long and holds 13 of General Electric's 1000-watt, 208-volt T3 quartz infra-red lamps. The lamps, thin tubes about 3/8″ in diameter and 13″ in length, are mounted in a single row parallel to the building's wall. They are mounted in the fixtures so that rays will be beamed slightly away from the store front. Tests indicate the heating will be effective 6 to 8 feet from the building.

Early tests of the installation have produced an intensity of approximately 80 watts per square foot at the sidewalk. This compares to the equivalent of about 10 watts per square foot in average home heating.

The net result is that Carson, Pirie, Scott and Company believes the new heat lamp system will make shopping more pleasant during winter months. It will take some of the chill off winter window-shopping. It should help keep sidewalks clearer and drier. And there'll be more pleasant light to shop by as well.

First 345-kv Underground Cable Delivered for Testing


OKONITE
345,000 VOLTS
America's First 345,000 Volt Underground Cable
MADE BY OKONITE
AEIC-EEI RESEARCH PROJECT AT CORNELL UNIVERSITY

FIRST 345-kv UNDERGROUND CABLE is unloaded at Cornell University's high voltage laboratory. Professor J. L. Rosson (left) will supervise the joint AEIC-EEI test program.

The first 345-kv underground power cable ever manufactured in the United States has been delivered by the Okonite Co., a subsidiary of Kennecott Copper Corp. to Cornell University for est purposes.

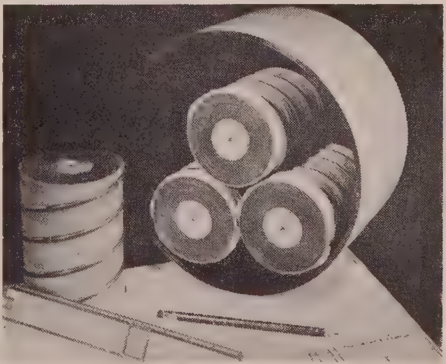
The cable is one of a group being upplied by four major manufacturers or the cooperative testing program, ointly sponsored by the manufacturers, Associated Edison Illuminating Companies and the Edison Electric Institute.

The cable has a 2000-MCM segmen- al copper conductor and is capable of ransmitting 500,000 kva. It is over our inches in diameter and weighs just under twelve pounds to the foot. It will be pulled into a 10-inch oil-filled steel pipe under a pressure of 200 psi.

Since the test section is single phase, wo lengths each approximately 380-eet long will be pulled into the pipe and connected by a 160-foot loop.

The test program at Cornell's high voltage laboratory is expected to continue for at least three years.

THE 345-kv UNDERGROUND CABLE manufactured by Okonite is similar to the 230-kva Oilostatic cable designed for the Cubato Power Station in Brazil over five years ago. A 1.035-inch wall of oil impregnated paper insulation is covered by a series of copper, Mylar and dacron tapes, bound with a "D"-shaped brass armor wire. Diameter is 4.02 inches.

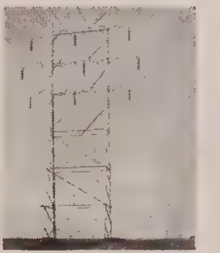


Burndy Improves Connector Seals

The Utility-Industrial division of the Burndy Corp. has introduced an innovation to simplify the installation of lectrical connectors filled with corro- ion inhibiting compound.

Replacing the adhesive tape formerly used to seal the ends of its connectors are yellow plastic Caplugs. The caps provide cleaner, easier removal of the compound seal, speed up installation and improve the appearance of the connectors.

FLINT
Galvanized
STEEL
For . .



- TRANSMISSION LINES

- DISTRIBUTION STATIONS

Is Custom-Made for Your Requirements by

- EXPERIENCED MEN

- MODERN METHODS

STEEL IS AVAILABLE
Competitive Delivery Anywhere
Your inquiries are invited . . .

AISC

FLINT
STEEL
TULSA, OKLA.
MEMPHIS, TENN.

"It's sure a good feeling
to know that this wire is
attached to Haley cross arms!"

Haley's

CEDAR POLES

and

FIR CROSS ARMS

Light in weight and clean.
PENTAchlorophenol
treated in our modern
plant for protection
against decay, moisture
and insect damage.

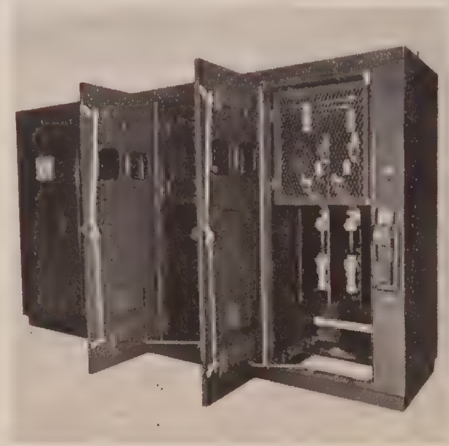
TWO strategically
located yards:
MINNEAPOLIS,
MINNESOTA
FINDLAY, OHIO

R. G. HALEY & CO.
SPITZER BLDG.
TOLEDO 4, OHIO

NEW PRODUCT DESIGN

Metal Clad Switchgear

A line of high-voltage fused load interrupter metalclad switchgear rated as high as 44,500 amps fault closing and 500 mva short circuit interrupting at 14.4 kv has been introduced by **S & C Electric Co.** Corresponding ratings at 4.16 kv are 60,000 amps fault closing and 250 mva short circuit interrupting. A new load interrupter with an integral quick-make, quick-break device for high speed closing makes it possible to close on 44,500-amp faults. Action is sequenced so that arcing takes place on separate arcing contacts before the load carrying contacts close. Interrupting duty to 500 mva is provided by a new solid-material boric-acid power fuse. Multiple-bore construction permits handling low, medium or high faults. Available in ratings from 4.8 kv through 14.4 kv, in continuous ratings of 200, 400, and 600 amps, fused. Ratings to 1200 amps are available unfused.

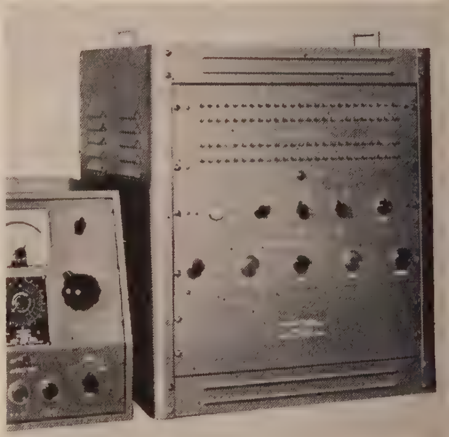


For more data, mark #23 on reply card

Dry-Type Fire Extinguishers

Walter Kidde & Co. has introduced 200- and 400-lb pressurized dry chemical hose rack extinguishers which are U-L approved for use on flammable liquid, gas, and electrical fires. The units can be wall. floor. or truck mounted. Features self-actuation and the nozzle has a lever which permits On-Off control. Has an effective range of 40 ft. Hose lengths of 50 or 100 ft are available. Both size units have Bridgeman seals.

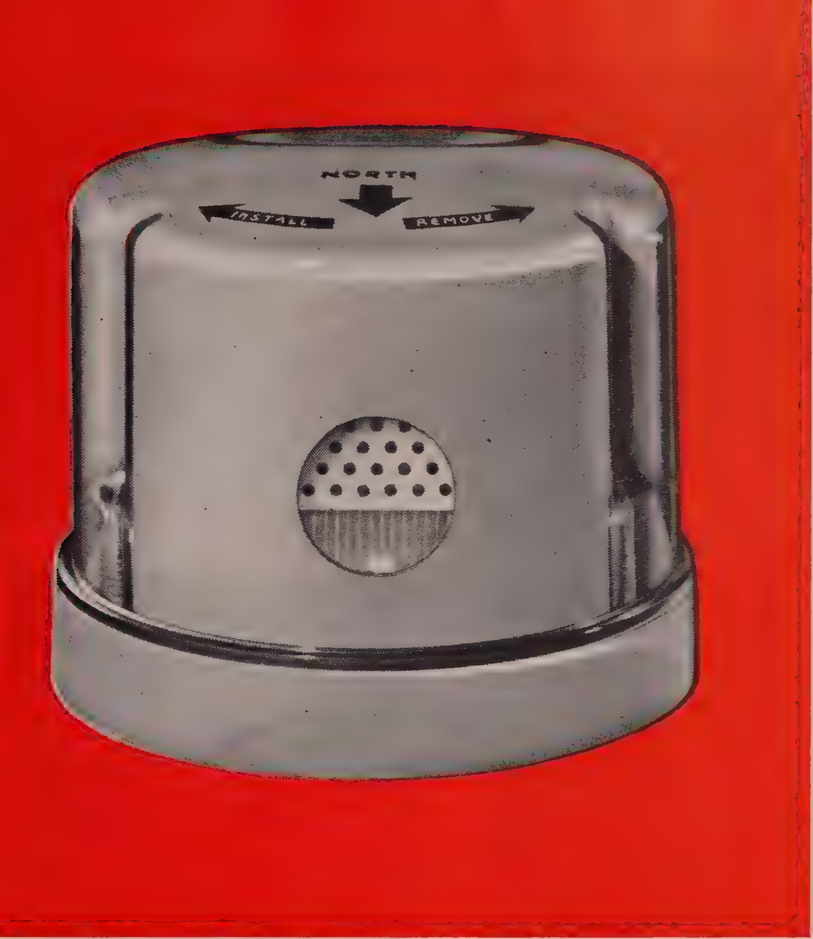
For more data, mark #24 on reply card



Insulation Life Tester

An instrument has been developed which operates automatically for periods up to 12 hours while making high voltage breakdown tests on as many as fifty test samples of transformers, motors, capacitors, and other electrical equipment. By **Associated Research, Inc.,** components or circuits connected to the tester are checked in sequence. Designed to test virtually any electrical device having insulation, automatically and unattended.

For more data, mark #25 on reply card



PROGRESS IN WASHINGTON

Incandescent series streetlights are being replaced by new mercury vapor types, individually controlled by Fisher-Pierce 6607A models. The short time delay permits fast checking of the control. Below, PEPCO Mechanic E. E. Mayfield explains control installation to Junior Mechanic C. F. Madigan.

GRAY COLOR and compact design of the 6600A Series control matches the modern PEPCO streetlight poles. All downtown structures in Washington—including streetlighting equipment—must meet rigid appearance standards.

For complete design information and specifications on [illegible] controls, write The Fisher-Pierce Co., 81 Pearl Street, [illegible] Braintree 85, Massachusetts.

FP

FISHER PIERCE

PHOTOELECTRIC LIGHTING CONTROLS

[illegible]

Designed and engineered specifically for tension stringing . . . lightweight — extremely rugged.

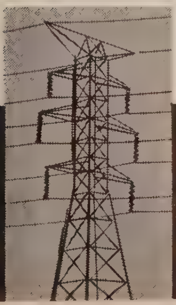
Sheave has permanently bonded Type GNA **Neoprene lining** — provides maximum protection to conductor. Sheave is mounted on shielded ball bearings.

All high strength aluminum alloy rib reinforced construction with built-in conductor guard and handles. Drop forged fittings. Safety locking, hinged side strap.

35,000 lbs. ultimate strength.
Sizes through 28" diameter . . . for all conductors through 1,780,000 C.M.

Complete Catalog on Request

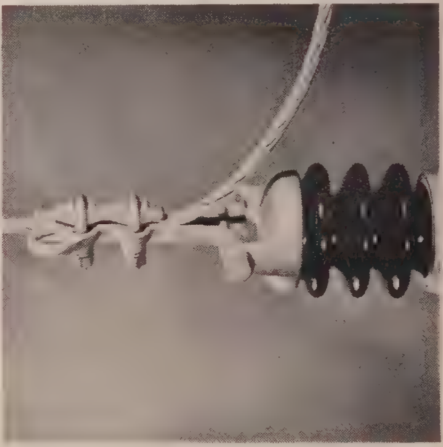
Sherman & Reilly, Inc.
ENGINEERS AND MANUFACTURERS
First and Broad Streets
CHATTANOOGA 2, TENNESSEE
Telephone AMherst 7-1273



Strain Clamps

Strain Clamps that introduce an entirely new approach to slack-span dead end construction have been introduced by **Lapp Insulator Co.** Used with standard top line posts, the new clamps give a neat, taut appearance, completely free from radio or TV interference. Mechanically, clamp and insulator assembly have 5000 lb tension rating. Available in aluminum or galvanized, malleable iron, in five sizes for conductors from .16 to 1.56 in.

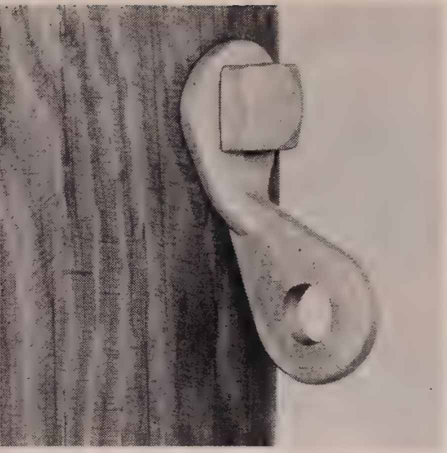
For more data, mark #26 on reply card



Current Transformer

A low-priced, 600 v indoor current transformer has been developed by General Electric Co. It is priced about 40 per cent lower than comparable indoor-outdoor models. The JCX-O is a butyl-molded transformer with either high base or low base, bar-type construction and is available in 200-, 400-, 600- and 800-a. ratings. The new transformer is specifically designed for indoor application but retains the basic features of the more expensive JCA-O transformer.

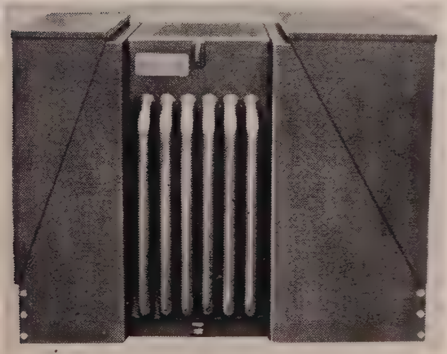
For more data, mark #27 on reply card



Guy Attachment

The J2575 guy attachment is a strong, single bolt fitting for fastening a wood strain insulator to the pole. This fitting provides the closest possible coupling between the pole bolt and the insulator. The angle of the down guy can be varied without bending the guy attachment because of the position of the hole for the strain insulator. Hot dip galvanized, it is forged from copper bearing steel, with 13/16″ holes for 3/4″ bolts. Made by **Joslyn Mfg. and Supply Co.**

For more data, mark #28 on reply card



3-Section Transformer

Central Transformer Corp. has announced a pad-mounted transformer designed especially for residential underground distribution systems. Features separate high and low voltage compartments and transformer. In the event of load growth, the Mini-Sub transformer unit may be easily removed without disturbing the high voltage section. Available in sizes 25 kva through 167 kva, 13,800Y, 13,200Y and 12,470Y to 240/120.

For more data, mark #29 on reply card

Look to Superior for

ENCLOSURES

Superior also offers a complete line of

TEST SWITCHES
TEST BLOCKS
SOCKET EQUIPMENT

Catalog 55 offers complete information on features, services, types and sizes. Write to:

SUPERIOR
SWITCHBOARD & DEVICES CO.
CANTON, OHIO
A subsidiary of
The Union Metal Manufacturing Company

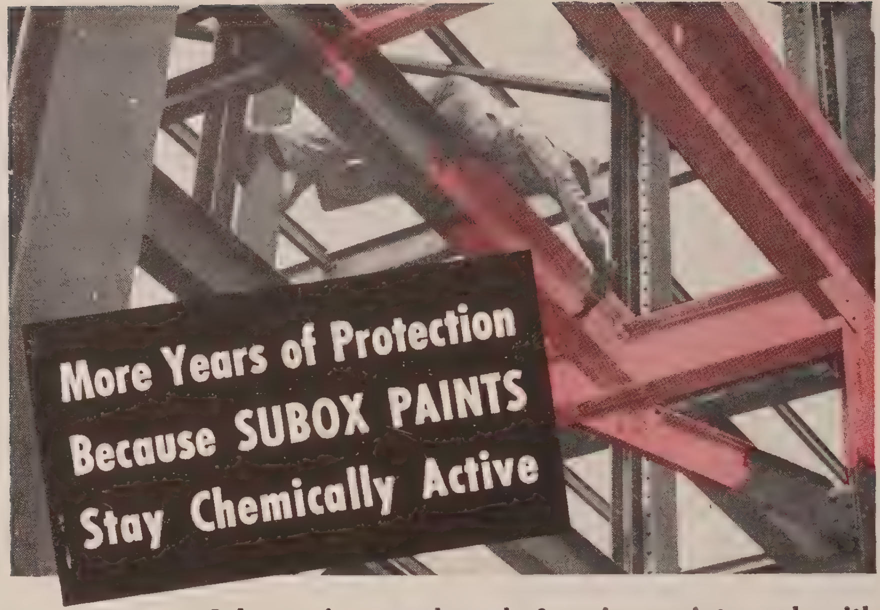
NEW COFFING SEALED HOIST
For Efficient Hoisting in Any Weather

Here is a new hoist designed for safe, efficient hoisting in any weather. Loads will not slip because the brake mechanism is permanently sealed in five places against moisture, oils, chemicals and dirt —all common causes of hoist slippage.

Safety features include the exclusive Safety Handle which bends to indicate overload. The free chain control is protected so that it will not accidentally trip.

Five models, ¾, 1½, 3, 4½ and 6-ton capacities are available. Ask your distributor for Bulletin ADH-78.

COFFING HOISTS
DUFF-NORTON COMPANY
807 Walter St. • Danville, Ill



Subox paints are the only American paints made with lead-suboxide. They give extra protection at no extra cost.

SMALL PARTICLES PENETRATE SURFACE

Maximum penetration is achieved because lead-suboxide is a colloidal pigment. Its film is so dense and impervious that two coats of Subox usually equal three coats of other paints . . . often one coat of Subox is sufficient.

CHEMICALLY-ACTIVE METALLIC FILM

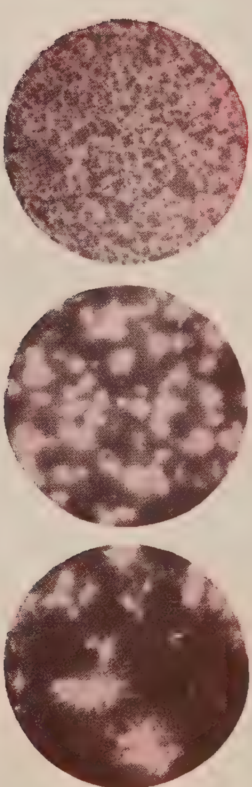
Lead-suboxide remains chemically active after Subox paint dries. It reacts with the fatty acids of the vehicle to form insoluble lead soaps, and builds up a reinforced protective film of intertwining metal-bearing fibers.

FIBROUS COAT IS STRONG ADHESIVE

The fibrous film of Subox gradually strengthens and replaces the original vehicle film (which otherwise would become brittle), and creates a strongly adhesive protective coating with an inherently longer life than that of other paints.

In addition to its other advantages and economies, Subox also saves on eventual repainting. The need for expensive scraping and repriming is largely eliminated.

Available in wide color range. Write for color card and the brochure "Subox Paints".



Dark areas in above photomicrographs show how pigment increasingly intertwines to form dense, protective film.

SUBOX PAINTS

Subox Inc.
Trade Mark

Established 1924
1 Fairmont Plant
Hackensack, N. J.

Subox Company of Canada—Weston, Toronto 15

Rock-Digging Auger

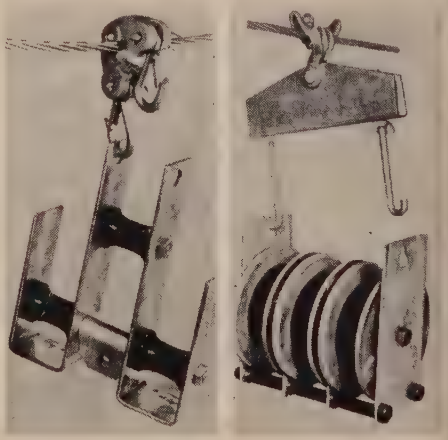
The PolerBore Auger by **Trainer Associates, Inc.,** is most efficient when digging through rock or through frost or frozen ground. Special cutting teeth make digging easy, preserve life of the digging machine. Available in 10-in. to 36-in. diameters and will drill either vertically or horizontally. With short make-ready time, rapid tooth change or replacement can be made when necessary. According to the manufacturer, the PolerBore will fit any digging machine.

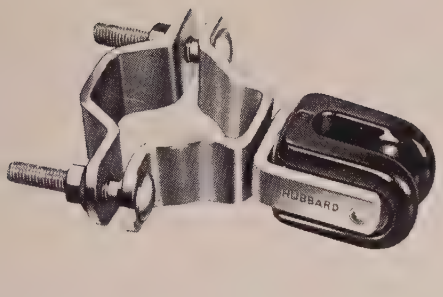
For more data, mark #30 on reply card

Multi-Blocks

Two new stringing blocks have been introduced by **Distribution and High Line Specialties Co.** Multi-Block-Span Spacing Type has delta configuration of non-metallic spools, mounted on RT bearings, gives proper position and near conductor spacing of 9- and 15-kv systems. Pole-to-Pole—Heavy Duty Type mounts two 8-in. dia. x 2-in. sheaves on one heavy yoke. Permits bull line stringing of two or three lines at the same time.

For more data, mark #31 on reply card





Wireholder

Hubbard and Company has announced an easy-to-install wireholder, No. 1695, for use on service entrance masts from 1¼ to 2½ in. nominal pipe size. Bolts do not have to be removed for installation due to slotted end of one side of mounting bracket. A shoulder on the carriage bolt holds it in place during fastening. Illustration is for 2½-in. installation. For smaller pipes, the keeper strap is inverted.

For more data, mark #32 on reply card

Oscilloscope Camera

A convenient, easy-to-use oscilloscope camera which records full-size oscilloscope patterns without distortion on Polaroid Land film is now available from **Hewlett-Packard Co.** Model 196A uses a standard camera bellows to eliminate light leakage. Has object to image ratio of 1:0.9 to show a full 10 cm graticule width. Multiple exposure procedure is simplified. Camera weighs only nine pounds and can be mounted to scope with one hand.

For more data, mark #33 on reply card

P & K OUTDOOR LIGHTING REPORT
the Modern Trend in LOW LEVEL LIGHTING
RATH PARK

TOP PHOTO: Location: Fairleigh Dickinson University, Madison, N. J. • Electrical Consultant: H. L. Sykes
LOWER PHOTO: Location: Rath Park, Franklin Square, L. I., N. Y. • Architect: Herbert D. Phillips
Consulting Engineers: Barstow, Mulligan & Vollmer

P&K CIRCLElux DAVITS & POSTS

modern lighting at a realistic cost

Here are two contemporary outdoor lighting installations – one an all new municipal swimming pool and recreational area – the other, a prominent New Jersey University. Both chose the P&K all aluminum CIRCLElux lighting package to illuminate and compliment their roadways, walkways, landscape and architecture.

The sweeping lines of the P&K CIRCLElux davit blend with the modern one story architecture of the Rath Park Swimming Pool. Yet, the modern, but stately, design of the P&K CIRCLElux post is in good taste with the traditional architecture of Fairleigh Dickinson University. The CIRCLElux lighting package is the correct low level lighting choice to compliment almost all types of architecture.

The P&K CIRCLElux is available in a wide range of davit styles and mounting heights. The post is available in one basic design but at various mounting heights and with the CIRCLElux you have a choice of three light sources – incandescent, mercury vapor and fluorescent. This combination of luminaires and davits or posts will enable you to specify "packaged" lighting units. This means easier specifying by using matched components which in turn can customize your lighting projects.

Send in your reservation now for the *new* CIRCLElux catalog.

P&K

PFAFF & KENDALL 84 FOUNDRY ST., NEWARK 5, N. J.

BRANCH SALES OFFICES: MIAMI, FLORIDA; BURLINGAME, CALIFORNIA
IN CANADA: POWERLITE DEVICES, LTD., TORONTO, MONTREAL, VANCOUVER
EXPORT REPRESENTATIVE: PHILIPS EXPORT CO., NEW YORK, N. Y.

SUPPLY FACILITIES

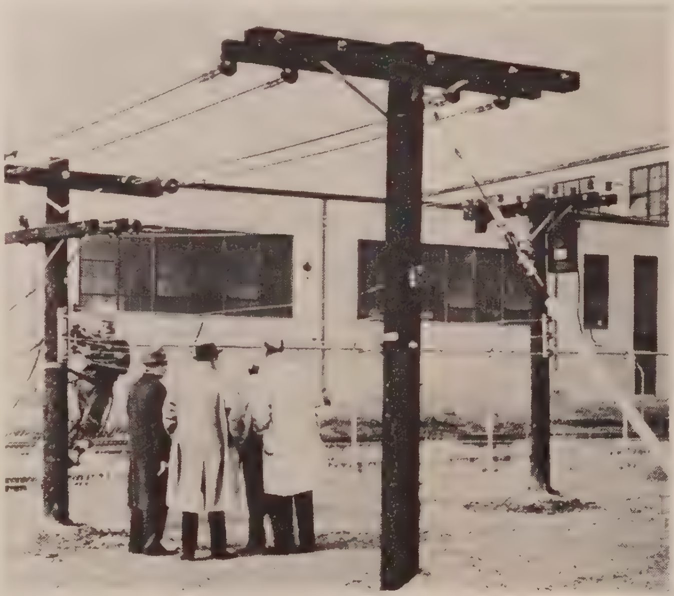
Thomas & Betts' Outdoor Test Laboratory

Thomas & Betts Co. has gone to testing of compression connectors, tools and accessories under actual working conditions. Since the products serve their useful life in overhead distribution lines, the Company has erected four utility poles, conveniently located outside the main plant in Elizabeth, New Jersey.

The utility poles are rigged with lines, connectors and insulators and the test facility duplicates a 4 KV distribution line. Lines of higher primary distribution can be set up by changing conductor spacing as well as insulators and other components. The only concession with actual working conditions is the height of the utility poles. For Thomas & Betts' purposes, twelve-foot high poles were selected. At this height, Company engineers can observe test installations and not miss any of the details.

The model distribution line serves as an ideal testing ground for new products. While this test installation is used primarily for environmental testing of standard T&B connectors, it is also available for testing special customer connector designs.

T&B has also found that the lines provide excellent exposure test racks. The outdoor laboratory is located less than a mile from the Atlantic Ocean, a major soap manufacturing plant and the world's largest petroleum refinery. This heavy industrial atmosphere provides severe weathering conditions.



PRODUCT PERFORMANCE under actual working conditions is guaranteed by an outdoor test facility set up by The Thomas & Betts Company. Here, engineers observe a test installation of new connectors.

Eisler

IMPULSE TESTED

TRANSFORMERS

Eisler has built transformers of all types for 38 years, and there's a complete range available up to 500 KVA. Our engineering staff will welcome the opportunity of working with you on your standard and special requirements.

DRY TYPE and LIQUID FILLED • STANDARD and SPECIALS

EISLER TRANSFORMER COMPANY, INC.
Division of Eisler Engineering Co., Inc.
20 NORTH SALEM STREET, DOVER, NEW JERSEY

— Production Briefs —

Kaiser Aluminum & Chemical Corporation has developed a new process and equipment for continuous casting of aluminum slabs which permits the company to supply products, such as impact extrusion stock, at substantial savings in material cost to fabricators.

The development enables production of "K-Slab" with close dimensional control at high speeds in a variety of thicknesses, widths and lengths. Both "K-Slab" and slugs blanked from "K-Slab" are being supplied to impact extruders where a cast metal structure is acceptable. Kaiser Aluminum also supplies a variety of alloy sheet slugs and "rod-type" slugs.

NWL Corporation, a holding company with interests in a number of diversified industries, has become affiliated with **Schwager-Wood Corporation,** Portland, Oregon, a manufacturer of high voltage electrical equipment. Effective immediately Schwager-Wood will become a completely autonomous division of NWL Corporation. It is emphasized that Schwager-Wood will continue to operate in the future under the same management and with the same policies as in the past.

In a move which integrates and modernizes its manufacturing facilities, the **Chase-Shawmut Co.,** a subsidiary of **I-T-E Circuit Breaker Co.** has relocated its entire organization in a new one story, 57,000 sq ft building. The move was made to provide a more integrated meshing of the company's manufacturing and assembly operations and obtain a smoother flow of materials. Chase-Shawmut produces fuses and current limiting devices which are sold direct and special lines which are incorporated into I-T-E equipment.

The **R. E. Uptegraff Mfg. Co.** has announced the formation of a wholly-owned subsidiary, the **Uptegraff Transformer Co.,** to meet the needs for expanding activity in the transformer field. The plant will produce distribution transformers ranging in size through 112½ kva.

A newly constructed 44,000 sq ft building will house the engineering and production facilities of the new subsidiary.

Aluminum Company of America has announced the formation of a new division—the Structural Division, under the responsibility of Phillip T. Coffin, general manager. According to F. J. Close, v.p., the new organization was instituted because of the growing importance of aluminum in the structural field. The new division will coordinate the research and development activities of the company in the structural field.

Dossert Manufacturing Corp. has just expanded its facilities by adding 10,000 sq. ft. to its manufacturing area, adding machinery and personnel. The expansion will enable Dossert to make more expedient shipments from stock and improve customer service on special requirements. According to Mr. Charles Martin, president, increasing demand for the company's underground and compression connectors has necessitated the move.

STERLING

Field Proven!!

HEAVY DUTY DIGGING...

FOR TRANSMISSION-DISTRIBUTION CONSTRUCTION

TOWER FOUNDATION DIGGING

34' TELESCOPIC POLESETTER

Cuts Costs

Cuts Job Delays

Now STERLING DIGGERS, noted for ruggedness, dependability and ease of operations, introduce their field proven, HEAVY DUTY MODEL.

Specifications include 3" Bar; Ford Industrial Engine; 34' Telescopic Pole Setter; 10,000 lb. Hydraulic Winch; Hydraulic Outriggers; completely integrated bank of Hydraulic Controls; Turntable, Fore and Aft Mounting on heavy duty truck.

Ideal for Transmission Construction Under Extreme Conditions.

THRU-OUT THE WORLD

STERLING DIGGERS

Mfgd. by

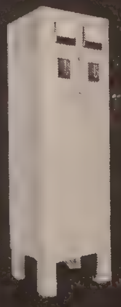
STERLING ENGINEERING & MFG. CO.
Wilkes-Barre, Pa.

— ASK FOR DETAILS AND DEMONSTRATION —
Five STERLING MODELS For Every Purse and Purpose
Nationwide Sales and Service
WYOMING VALLEY EQUIPMENT DIVISION
714 Wyoming Avenue, Kingston, Pa. — BU 7-3158

MAG\NIS\TROL

...a NEW LINE of fully automatic silicon battery chargers by... ACME

- NEWEST CIRCUITRY OF PROVEN DESIGN
- TRANSISTORIZED CONTROL
- PRECISION PERFORMANCE
- LONG UNATTENDED SERVICE
- 100% SAFETY FACTOR
- ALL COMPONENTS EASY TO REACH
- COMPACT WALL OR RELAY RACK INSTALLATION



FOR COMPLETE INFORMATION CONTACT
WILLIAM BRYAN, SALES MANAGER
CUSTOM EQUIPMENT DIVISION

MODEL
M129C25
25 AMPERES
AT 129 VOLTS

ACME ELECTRIC CORPORATION • CUBA, NEW YORK
PLANTS IN • CUBA, N. Y. • ALLEGANY, N. Y. AND HAWTHORNE, CALIF.

RAY-LINE

NEW IMPROVED DOUBLE DUTY PORTABLE
COMBINATION EMERGENCY LIGHT
SEARCHLITE & FLOODLITE

"REASONS WHY"

"Ray-Line" Emergency Lights are used by leading Utility Companies.

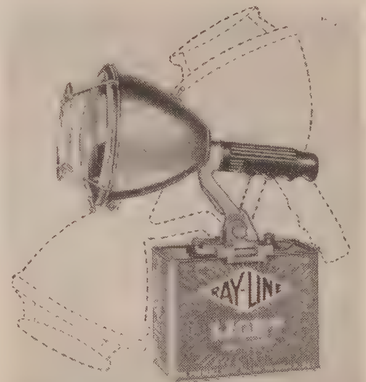
1st: They save TIME when every minute lost means DOLLARS.

2nd: Batteries can be changed in seconds—only one thumb screw to adjust. No tools needed.

3rd: Each new battery has its own steel case. No corrosion as occurs with separate battery containers.

4th: A powerful Searchlite Ray for distant line inspection and a Floodlite for nearby use.

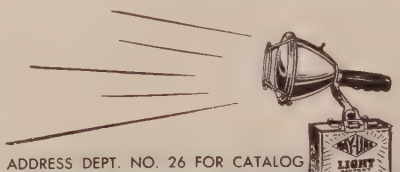
5th: Lamp unit constructed of non-corrosive aluminum to give years of service.



STRAIGHT UP FOR POLE WORK.
STRAIGHT DOWN FOR MANHOLE WORK.

Send coupon for information and free trial offer. No. 26

Name
Firm
Street
City



ADDRESS DEPT. NO. 26 FOR CATALOG

THE PORTABLE LIGHT CO., INC.
216 WILLIAM STREET • NEW YORK 38, N. Y.

A further step in its expansion in the aluminum fabrication field has been announced by the **Olin Mathieson Chemical Corp.,** who has acquired full ownership of Almetco, Inc., by purchasing the one-half interest formerly held by Textron, Inc.

Almetco operates an aluminum extrusion plant at Nesquehoning, in eastern Pennsylvania. Its extrusion products are used in the architectural, transportation, highway supply and other fields.

Sales Briefs

The **Eads Company,** Houston, Texas, has been appointed to handle CFC Honan-Crane and Delpark Filtration Equipment for **Commercial Filters Corporation.** Product line includes filters to provide micro-clarity for all types of industrial oils and other liquids. **Shaw Engineering** of Houston will continue to handle CFC Fulflo Filters.

G-E Previews . . .

(Continued from page 101)

commented that "if we can really establish a working partnership between us in the markets you serve, make use of all the sales promotional tools that are to be made available, we can exert a strong influence on both builders and householders."

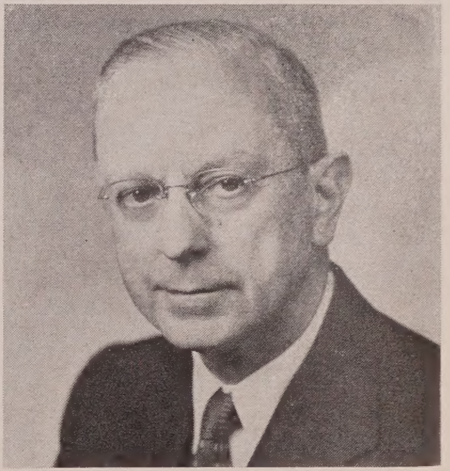
In a discussion of the service-entrance problem, M. R. Rodger, vice-president, Middle West Service Co., urged that electric utilities initiate positive action to correct the service-entrance bottleneck by capitalizing service-entrance equipment. He presented evidence that the percent return earned from wiring programs is more than sufficient to justify the additional investment.

Mr. Rodgers noted the shifting of system peaks and how the increased sales of large-use, high-percent-return appliances can be the key to improved utility earnings in the future.

Utility-dealer relationships were analyzed by Ross Cahal, Jr., senior marketing consultant for Ebasco Services, Inc. He covered the general climate for utility sales ally relations, dealer attitudes toward utility sales activities, the utility's ability to influence the dealer, and recommendations for making sales programs more effective. He particularly urged closer cooperation between manufacturers, distributors and utilities, starting with a joint understanding of objectives.

MEN OF POWER

Fairman Wins AIEE Edison Medal

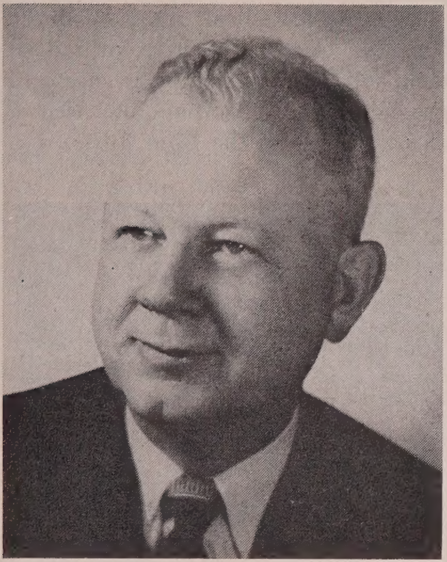


James F. Fairman, senior vice president, Consolidated Edison Company, has been awarded the 1959 Edison Medal by the American Institute of Electrical Engineers. It will be presented during the Winter General Meeting of A.I.E.E. in New York January 31-February 5.

The citation accompanying the Medal was "for outstanding performance in improving the design of large electric power systems; for farsighted leadership in atomic power development; and for unremitting efforts to improve the engineering profession."

Mr. Fairman, who is a past president and a honorary member of A.I.E.E., has overall responsibility for the nuclear electric generating station Consolidated Edison is building at Indian Point in Westchester County. He has been chairman of the Edison Electric Institute's Technical Appraisal Task Force on Nuclear Power since it was established in 1956.

Walsh to New Post



Carroll H. Walsh, chief engineer, has been elected to the post of vice president of the Arkansas Power & Light Co. The appointment was effective Jan. 1.

Mr. Walsh is a veteran of more than 32 years of service to AP&L. In his new position he will be responsible for the engineering and other duties now under his control. He was named electrical engineer in 1938, assistant chief engineer in 1956, and chief engineer in 1958.

Two Named at NEGEA Service Corp.

Two vice presidents have been named at New England Gas and Electric Association Service Corp. — Horton L. Chandler and Roy E. Wright. Mr. Chandler will be in charge of relations and Mr. Wright sales.

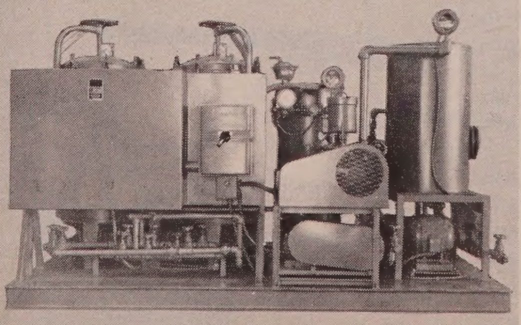
Formerly associated with the New Hampshire Public Service Commission, Mr. Chandler has been with the organization since 1946. He is a graduate of Dartmouth College and Harvard Law School.

Mr. Wright came to NEGEA in 1930 from Toledo where he was connected with the gas industry. He became director of gas sales in 1936 and director of gas and electric sales for the Service Corp. in 1957.

Hasbrouck New V.P.

Election of Kenneth W. Hasbrouck as vice president of the New York State Electric & Gas Corp. has been announced. Until his election, Mr. Hasbrouck has been assistant vice president.

In his new post, Mr. Hasbrouck will continue to be in charge of the company's rate and regulatory matters.

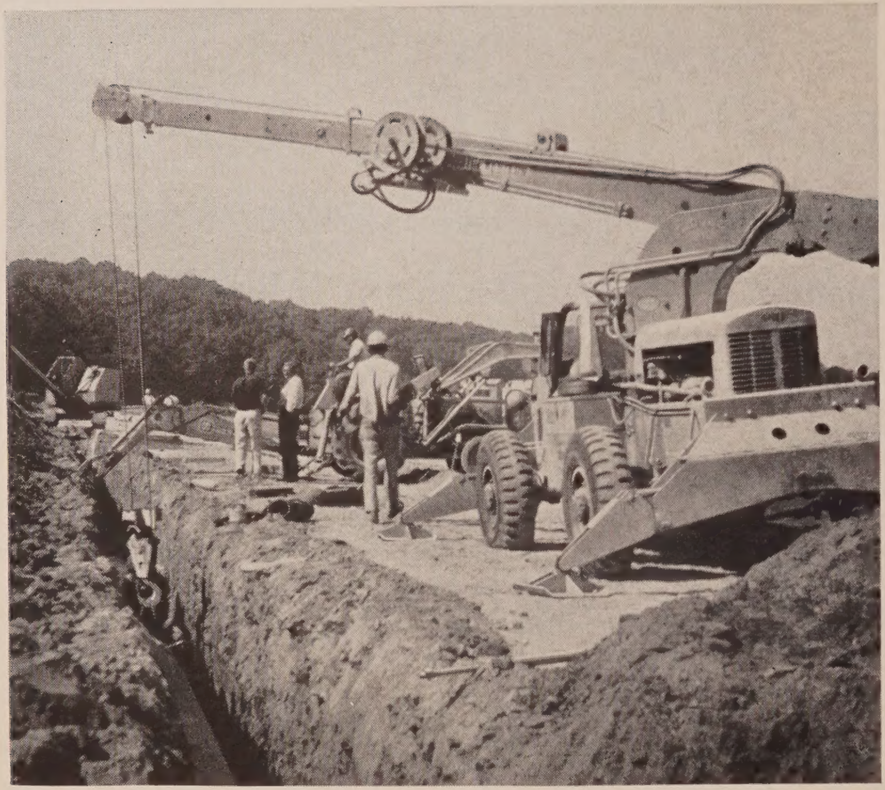


RECONDITION OIL WHILE YOUR EQUIPMENT IS ENERGIZED

There's no need for shutdowns or down-time when you use CFC Purivac® to recondition oils for transformers, power transmission cables, circuit breakers, switchgear and cable impregnating oils. Purivac operates as a portable unit in the field *while electrical equipment is in service*, as well as at central overhaul stations.

Purivac filters, dehydrates and degasifies in one automatic operation. Purivac is safe, economical and highly efficient in restoring interfacial tension and dielectric strength to extend oil life indefinitely. Write for literature to Department EL.

COMMERCIAL FILTERS CORPORATION
MELROSE 76, MASSACHUSETTS
PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA



A-W hydraulic crane holds gas pipe accurately in place while workman in trench connects joint.

AUSTIN-WESTERN HYDRAULIC CRANE—

Fast, safe way to lay pipe!

Baltimore Gas and Electric Co. operators say, "Even 90-ft. lengths of 16-in. pipe can be handled with precision, and in complete safety to men and equipment, by our Austin-Western hydraulic crane.

Most useful equipment

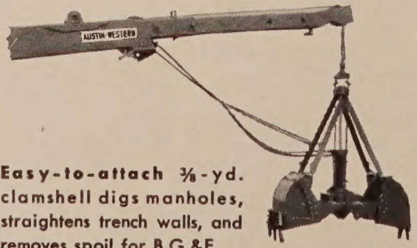
"It is the most useful piece of lifting equipment ever assigned to our construction crews. It loads and unloads pipe and strings it along construction routes. The A-W's telescoping boom holds pipe for welding, then accurately positions it in the trench until the joint is connected."

They also report that the Model 210's all-wheel drive and steer permit it to work over varied terrain. It climbs embankments, crosses creek beds, or maneuvers in-and-around, up-and-over obstacles which would otherwise slow construction progress.

A-W cranes will lift and tote lengths of pipe or pole like jack-straws; lift and help install transformers, pumps and valves or handle heavy reels of line and cable. The A-W's have virtually unlimited applications in power, gas or water company operations. Ask us for the figures on actual dollar savings being made by A-W cranes for leading utility companies across the U.S.!

5 models available

There's an A-W crane just right for your lift, carry or place requirements. Available in five models with capacity ranges from 3 to 11 tons; self-propelled, truck or stationary mountings. Write today or see your nearest Austin-Western distributor for more information.



Easy-to-attach ⅜-yd. clamshell digs manholes, straightens trench walls, and removes spoil for B.G.&E.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

Ohio Edison Elects Two

D. Bruce Mansfield, general counsel, has been elected executive vice president, and Ed F. Dissmeyer, in charge of production and transmission, elected vice president of the Ohio Edison Co.

Mr. Mansfield has been with the company since 1948. From 1941 to 1948 he was a member of the law firm of Amerman, Mills, Mills, Jones and Mansfield. Previous to that he was an attorney for the Securities and Exchange Commission. He is a graduate of Kenyon College and holds law degrees from Duke University and Yale.

Mr. Dissmeyer has been associated with the company and its predecessor affiliated companies for 30 years. He was named Edison's chief engineer in 1952 and was delegated to handle special engineering and operating assignments in 1958. He assumed his present responsibility for production and transmission early in 1959.

Men of Power Briefs

Consolidated Edison has elected **J. Eliot McCormack** vice president-production and appointed **William C. Beattie, Dr. William P. Eckes,** and **Gordon R. Milne** assistant vice presidents; **Dr. S. Charles Franco,** executive medical director; **Thomas C. Duncan,** chief electrical engineer; and **Harry W. Dierman,** chief mechanical engineer.

Recently elected financial vice president of the Hartford Electric Light Co. was **Charles Bolton.**

Two utility executives have been elected to the board of directors of the National Industrial Conference Board. They are **Walter T. Lucking,** president of Arizona Public Service, and **Erwin H. Will,** chairman, Virginia Electric and Power Co.

Tampa Electric has appointed **W. J. ampbell** administrative assistant to ne vice president-sales, **V. S. Price.**

Seventeen of the 44 new Fellows of ne American Nuclear Society are from ne electric utility industry. They are: **arl Cohen, Henry Hurwitz, Jr., . H. Kingdon, Miles C. Leverett, . M. Parker, W. K. Woods,** all of -E; **Sidney Krasik** and **J. W. Simpon,** Westinghouse; **D. W. Kerst** and **. W. Nordheim,** General Atomic; **. R. Cohen** and **Sidney Siegel,** tomics International; **Harold Etherngton,** Allis-Chalmers; **A. R. Kaufnan,** Nuclear Metals; **Gale Young,** luclear Development Corp. of Amerca; and **Walter H. Zinn,** General luclear Engineers Corp.

angamo Workshop

(Continued from page 100)

uit stability limit. When incorrectly pplied, it may even aggravate existing onditions. To a limited extent, series apacitors will also provide certain ther benefits such as increased steady oltage level and power improvement nore commonly associated with shunt apacitors, Keezer stated. Primarily, eries capacitors are installed to reduce ne net reactance of the circuit. Any ther benefits obtained are incidental, e said.

In Series With Transformers

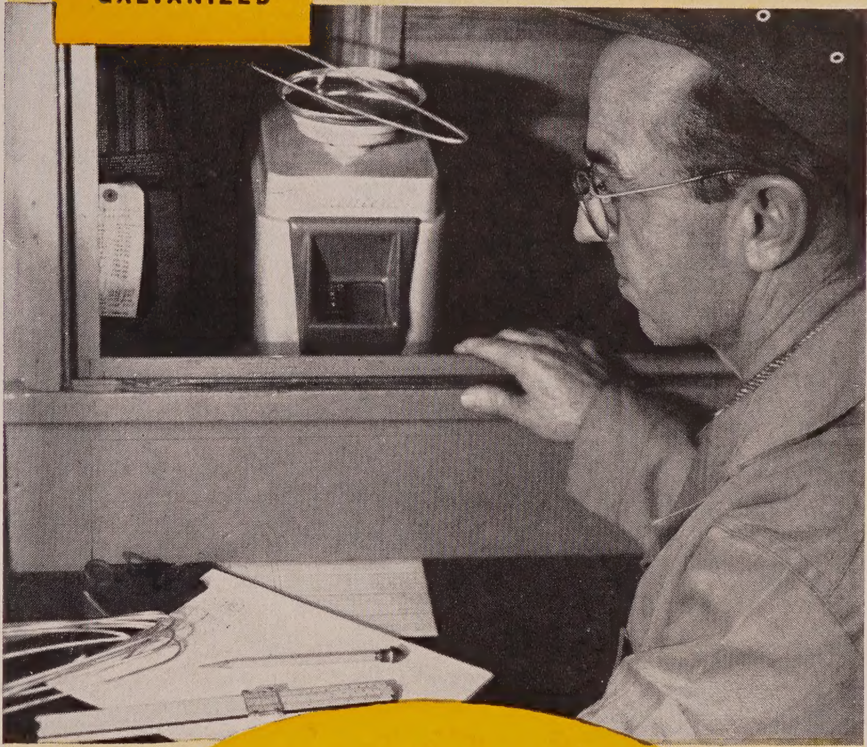
Operating experience with secondary apacitors in series with distribution ansformers at Public Service Co. of klahoma was described by Fred C. rowell, load and voltage supervisor. ssential text of his paper will be preented in an early issue of EL&P.

FOR *SAFETY'S SAKE* USE
COHARDITE
INSULATED TOOLS

Play safe with personnel, tool costs and workmanship. Most modern utilities equip their men with famous — COHARDITE INSULATED TOOLS. Cohardite — the never-peel, insulating material — gives extra protection (tested from 5000 to 20,000 volts) — from handle to ⅜" point in Standard and Metermen's SCREWDRIVERS — complete handle in ADJUSTABLE HEAD WRENCHES — entire frame in HACKSAWS — up to socket in NUT RUNNERS. Write for complete folder.

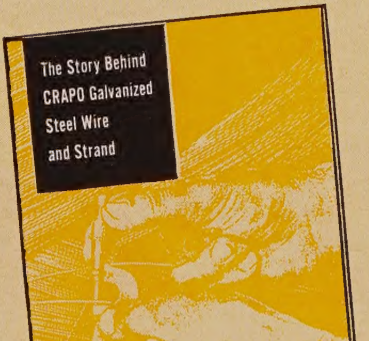
INSULATED TOOL CO., INC.
BAR MILLS, MAINE

Crapo
GALVANIZED
STEEL STRAND



WEIGHT OF COATING TEST

...added assurance of dependability



The Story Behind
CRAPO Galvanized
Steel Wire
and Strand

The life of galvanized steel strand depends primarily upon the weight and quality of the zinc coating. The heavier the coating the longer the strand will last.

The wire used in CRAPO Galvanized Steel Strand is regularly subjected to the hydrochloric acid antimony chloride, or weight of coating, test. By means of this test the amount of zinc on the surface of the wire can be accurately measured.

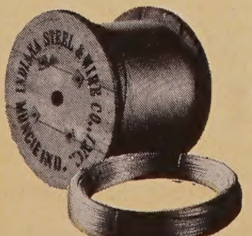
This is but one of the many laboratory tests to assure consistently high, dependable quality in the finished product.

AVAILABLE IN 3 COATING WEIGHTS

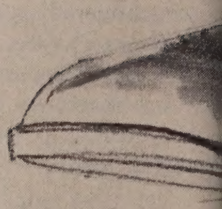
CRAPO Steel Strand is regularly furnished in all standard sizes and grades and in Class A, B and C coatings. Class B coating is twice as heavy as Class A coating; Class C coating is three times as heavy.

Write for this FREE BOOKLET!

"The Story Behind CRAPO Galvanized Wire and Strand" describes and illustrates manufacturing and testing techniques. Ask for Booklet B-59!



INDIANA STEEL & WIRE CO., INC.
Muncie, Indiana



IMPACT

in the right place does it

You need plenty of impact to cut through sales resistance. And you have to direct your effort to the right place.

Electric Light and Power takes your sales story to the buying group — to the men who count most in the electric power industry. *EL&P delivers more personally addressed copies* to top key men, by name, title and company, than any other publication serving this field.

So when it comes to sales impact — hitting where it counts most — talking to the real buyers — EL&P is your first buy. It gets sales action because it reaches the men who can *take action.* Haywood Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill.